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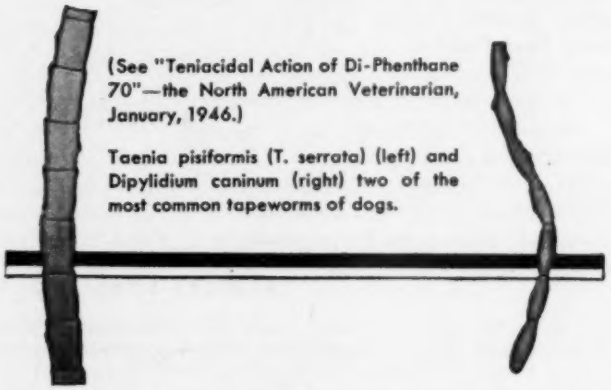

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Newcastle Disease and Fowl Plague Investigations in the War Research Program

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Boston, Massachusetts

IN 1942, the National Academy of Sciences and the National Research Council appointed a committee to advise the War Research Service upon various emergency disease problems. This committee recognized that the production of the essential foods, eggs and poultry, greatly expanded under the stress of war, appeared particularly vulnerable to the inroads of devastating diseases. Among the major threats were fowl plague, or pest, and Newcastle disease, both characterized by high diffusibility, morbidity, and mortality, and against which effective control measures were not known.

A special project recommended by the Advisory Committee for the development of adequate control measures against these maladies was planned in 1942 and initiated in 1943, under a contract between the War Research Service of the Federal Security Agency and Harvard University. After Sept. 1, 1944, the project was continued until its termination on Nov. 30, 1945, under the direction of a War Department Commission.[1]

The investigations upon Newcastle disease and fowl plague were directed chiefly toward: (1) perfection of diagnostic procedures especially to provide prompt recognition and differentiation, (2) development of effective methods and vaccines for active immunization, and (3) elucidation of epizoötiology as a basic control measure.

The following sections of this report are devoted to a brief general presentation of the facilities and procedures employed in the work, together with the more important results derived from the investigations, all of which will be reported in greater detail in later publications.

Facilities and Procedures

Numerous safeguards acceptable to the military authorities, the U. S. Department of Agriculture, and Massachusetts officials were established at the outset for the project work which was conducted at the Harvard Medical School, Boston, Mass.

The precautions to prevent dissemination of the viruses from the laboratory included: (1) the exclusive use of a large five-unit building which was kept under continuous surveillance and entrance to which, with the exception of the receiving office, was limited to laboratory personnel and caretakers; (2) the construction of separate isolation units for each disease, and of intervening "neutral zones" between stock and noninfected experimental animal

[1]This research project was conducted under the direction of a War Department Commission consisting of: Brigadier General R. A. Kelser, U. S. Army; Dr. R. E. Dyer, U. S. Public Health Service; Dr. H. W. Schoening, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture; Dr. E. B. Fred, University of Wisconsin.

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Dr. Moses is now associate pathologist, Purdue University, Lafayette, Ind.

quarters; (3) installation of isolation subunits of the Horsfall-Bauer type; (4) floor construction in the animal isolation rooms which permitted "flooding" with disinfectant solutions; (5) provision for utilization of aërosol disinfectants; (6) provision of laboratory clothing and shower bath facilities for each unit; (7) utilization of suitable chemical disinfection, heat sterilization, and incineration facilities, the latter being used for disposal of all combustible materials (carcasses, litter, etc.,) subsequent to sterilization; (8) the mechanical filtration of air drawn into the ventilation system and subsequently through the isolation room; and (9) successive filtration and ultraviolet treatment of the air egressing from the laboratory building.

At the beginning of the work, only one strain each of the virus of Newcastle disease and fowl plague was available. These were provided by the Ministry of Agriculture and Fisheries, Weybridge, Surrey, England, in the form of pieces of infected chicken liver and spleen suspended in 50 per cent glycerin-saline. Both strains had been passed in fowls at three-month intervals in the Ministry Laboratories and were prepared for shipment in May, 1943.

The fowl plague virus was of Dutch East Indies origin and had arrived in England before 1932.

The Newcastle disease virus had been obtained from the 1933 outbreak in England[1].

Additional strains of Newcastle virus, including several tentatively identified and some unidentified agents, subsequently became available for study in the laboratory. They came from the following sources:

Two strains, isolated from field outbreaks of Newcastle disease in New Jersey by Dr. F. R. Beaudette, in February and March, 1945.

One strain, isolated from "spontaneous" infection in laboratory stock birds, in March, 1945.

One strain, isolated from an outbreak in New York by Dr. P. P. Levine and forwarded to the laboratory by Dr. H. W. Schoening, in July, 1945.

Three strains, isolated and identified in this laboratory from chicken tissues forwarded through U. S. Army channels from the Veterinary Institutes at Perugia and Milan, Italy, in June, 1945.

Animals including mice, rabbits, and chickens purchased for experimental purposes were held in quarantine for a suitable period before use. Of the approximately 9,000 chickens employed in these investigations, all but 1,200 were reared in the laboratory after hatching there or after having been introduced as day-old chicks. The embryonating eggs used for a large number of infection, titration, and neutralization studies were obtained almost exclusively from a single well-bred flock of White Leghorn chickens.

PRINCIPAL ACCOMPLISHMENTS OF THE PROJECT STUDY

1) Identification of Newcastle virus infection in the Western Hemisphere for the first time (Jan., 1944). Presumptive identification of so-called pneumoencephalitis of poultry with Newcastle disease had been accomplished previously by J. R. Beach[2]. The identification with Newcastle virus by this laboratory was based on embryo and chicken infectivity, pathology, and survival time; hemagglutination activity of the virus and specific hemagglutination inhibition by serum; pH sensitivity pattern of the virus; cross serum neutralization activity; and reciprocal immunity in chickens.

2) Verification of the identity with Newcastle virus of an agent which had been isolated by Dr. Beaudette from a disease outbreak among chickens in New Jersey in February, 1945. This investigator had determined that the virus was neutralized by Newcastle immune serum provided by this laboratory. Confirmation of the identity with Newcastle virus of the strain isolated by Dr. Levine, in New York.

3) Determination of the immunologic identity with Newcastle disease of the pest-like epornitic of poultry prevalent in Italy in 1940 and later in other parts of Europe.

4) Determination of the pH infectivity-stability curve of Newcastle virus, confirmation of previous observations on this character of fowl plague virus, and demonstration of the dissimilarity of Newastle and fowl plague viruses on this basis, which may serve as an important diagnostic aid.

5) Preparation and processing of quantities of Newcastle immune serum and of fowl plague immune serum for use by the Bureau of Animal Industry, U. S. Department of Agriculture, and for distribution to other laboratories for the recognition of Newcastle infection. Preparation of a considerable stock of both Newcastle and fowl pest, formalin-inactivated, egg-propagated vaccine and storage for use in event of emergency.

6) Extensive investigation of procedures for immunization against Newcastle disease and against fowl plague and the development of inactivated (by formalin or ultraviolet light), and of modified, living virus vaccines that would appear to be of value in controlling these diseases.

7) Demonstration of significant quanti-

ties of Newcastle disease antibodies in the yolks of eggs laid by Newcastle immune hens and of the transfer of the antibodies, during embryogenesis, to the embryo. In turn, the postnatal, yolk-conferred, passive immunity was shown to persist in demonstrable degree for the first month and to protect the chick against the specific virus, while simultaneously preventing an active immunity response to vaccine treatment or to inoculation with virulent virus.

8) Procurement of data on the comparative pathology of Newcastle infection as produced experimentally in chickens by the European and American strains of the virus, and on the pathology of fowl plague.

9) Demonstration of the usefulness and limitations of embryonating chicken eggs for the isolation and cultivation of Newcastle disease and fowl plague, and analysis of the pathology of the infected embryonic tissues.

10) Isolation and characterization of several variant viruses derived from the Dutch East Indies strain of plague virus. The variant strains were of low virulence but of high immunogenicity and, hence, of potential value for immunization.

11) The utilization of penicillin sodium for the direct isolation, by the use of embryonating eggs, of the Newcastle or fowl plague viruses from bacteriologically contaminated material.

12) Examination of a variety of tissues and materials from outside sources for the presence of fowl plague and Newcastle viruses and for specific antibodies.

13) Demonstration of the lethality of Newcastle virus for mice by the intracranial route. Confirmation of previous work on the adaptation to the lethality for mice of fowl plague infection, and determination of distribution and concentration of the virus in various tissues.

ACKNOWLEDGMENT

The helpful counsel and encouragement by various members of the War Research Service and the War Department Commission are gratefully acknowledged. Appreciation is also due Dr. John F. Enders and Dr. S. B. Wolbach, of Harvard Medical School, and to Lt. Col. A. T. Thompson, U. S. Army, and Commander Wm. B. Sarles, Jr., U. S. Navy, for valuable assistance and suggestions in carrying out the project work.

The conscientious effort and valuable technical and clerical assistance of the following individuals are also gratefully acknowledged: Miss Margaret Brush, Miss Hilda Foster, Mrs. Mary Howland, Miss Rebecca Stickney, Miss Mary Graham, Miss Dorothy Kaufman, Miss Jennie Andreassen, Miss Alice Holland, Miss Elizabeth Fleming, Miss Nancy Winslow, and Miss Barbara Schaufele.

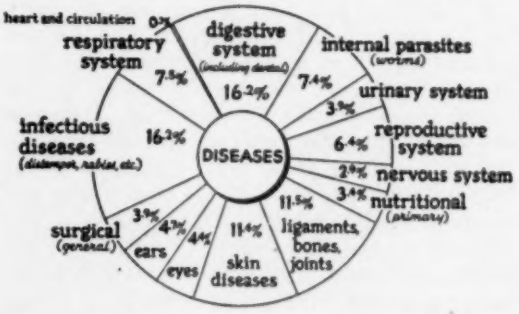
References

[1]Dobson, N.: Newcastle Disease. Proc. 7th World Poult. Cong., Cleveland, Ohio (July-Aug., 1939): 250-253.

[2]Beach, J. R.: The Neutralization *in vitro* of Avian Pneumoencephalitis Virus by Newcastle Disease Immune Serum. Science, *100*, (1944): 361-362.

Relative Incidence of Diseases Among Pet Animals

The following chart, lifted from the 1946 Year Book of The Anti-Cruelty Society of Chicago, gives a practicable clue to the various groups of diseases affecting pet animals of which 84.3 per cent were dogs, 11.0



per cent cats, and 4.7 per cent miscellaneous (birds, rodents, monkeys). The number of animals handled by the Society last year was about 48,000, a drop from 60,820 during the prewar year of 1941, or enough animals, particularly dogs and cats, to give dependable value to the percentages. Moreover, the booklet which is entitled "Putting the Stopwatch on Kindness" shows extremely accurate recording in the form of charts and graphs on humane activity in this and other respects. Dr. W. A. Young (I.S.C. '19), managing director of a board of 18 members, superintends the Society's far-flung ramifications in local and national humane work as well as this extensive medical service and records.

The Status of Avian Pneumoencephalitis and Newcastle Disease in the United States

J. R. BEACH, D. V. M.
Berkeley, California

THE PURPOSE of this communication is to clarify the rather confusing situation created by application of the term "avian pneumoencephalitis" on the West Coast and "Newcastle disease" on the East Coast to what appears to be the same disease. To accomplish this purpose, a brief historical review of our observations and studies of the disease is presented.

DESCRIPTION OF THE DISEASE IN CALIFORNIA

In 1940, numerous flocks in California from 2 to 10 weeks old were affected with a type of disease which had not previously been observed[1]. The outbreaks began as a respiratory trouble which spread rapidly through the flocks. In a few days after its appearance, some of the chicks developed symptoms of involvement of the central nervous system, the number of such cases varying from less than 1 per cent to about 50 per cent in different flocks. The disease became known as a respiratory-nervous disorder[2, 3] but this was soon replaced by the term avian pneumoencephalitis[4]. Despite the fact that the spread of the disease through a flock was very rapid, artificial transmission proved difficult and it was not accomplished until 1941. The cause of the disease was then shown by Stover[2] and Beach[3, 4] to be a filterable virus which could be propagated in chicken embryos. Using the embryo-culture technique, the virus in 1942 was also identified[4] with a previously unclassified type of respiratory disease of laying pullets, which had been prevalent in the state and studied since 1935, and which was known in different localities as "chicken-flu" and "nine-day pneumonia." The loss from death in infected flocks had been so small that poultry raisers felt concern about the disease only because of its depressant effect on egg yield. In 1942, however, outbreaks in which some of the birds showed nervous symptoms were observed[5].

As already stated, the average mortality from avian pneumoencephalitis has been small. The gross lesions seen in infected chickens are mucous exudate in the tracheas and cloudiness of the membranes which form the air sacs and mesenteries. Neither of these are pathognomonic and the latter is inconstant. After continued propagation in embryos or passage through a series of chickens, however, the virus becomes so highly virulent that inoculation of chickens with minute doses of it causes death in four to six days and hemorrhagic lesions, particularly of the proventriculus and small intestines, are present in a majority of those which succumb. An interesting and, as yet, unexplained phenomenon of the artificially induced disease is that infected chickens do not have the respiratory symptoms which are predominant in the natural disease.

AVIAN PNEUMOENCEPHALITIS AND NEWCASTLE DISEASE VIRUSES IMMUNOLOGICALLY RELATED

Because of the highly virulent nature of the cultured pneumoencephalitis virus, it seemed of interest to determine if it might be related to the viruses of either fowl plague or Newcastle disease, two highly fatal diseases which were not known to be present in the United States. Through the coöperation of the Bureau of Animal Industry of the U. S. Department of Agriculture, a small quantity of antiserum for each virus was obtained from England in 1943 and used for *in vitro* neutralization tests with pneumoencephalitis virus. The infectiveness of the virus was not affected by mixing it with the fowl plague immune serum, but definite neutralization of the virus was obtained with the Newcastle disease immune serum[6]. These results indicate that the virus of pneumoencephalitis is immunologically related to the virus of Newcastle disease. But, to quote from the report of the Committee on transmissible diseases of the U. S. Livestock Sanitary Association at the December, 1944, meeting, "whether this means that Newcastle

From the Department of Veterinary Science, University of California, Berkeley, Calif.

disease and pneumoencephalitis are caused by the same virus or by two antigenically related viruses remains to be definitely proved"[7]. A factor which supports the latter conception is the wide difference between the clinical aspects of pneumoencephalitis (or Newcastle disease) in the United States and Newcastle disease as given in reports concerning it from other countries. Newcastle disease is described as being readily transmissible and causing severe death losses. Doyle[8], for example, states that the mortality in naturally infected flocks is usually 100 per cent; and Stater[9] reports that it is the most dreaded chicken disease in India, where it is known as Raniket disease. In contrast, as has already been pointed out, transmission of pneumoencephalitis to normal chickens from field cases has proved difficult and the average mortality from it has been small. Furthermore, during the ten or more years of its known existence in California, it has not shown any sustained tendency to assume a more severe character.

The experimental results showing the immunologic relationship of the two viruses were immediately submitted to the Bureau of Animal Industry, U. S. Department of Agriculture, but not reported elsewhere until some time later. This information prompted the issuance, in June, 1944, by the Agricultural Research Administration, Bureau of Animal Industry, of Circular Letter 2652 to inform livestock disease control officials of the finding and to advise them and others concerned with poultry disease control to be on the lookout for the disease.

Disease Identified on East Coast in 1945

In March, 1945, a disease which was occurring in poultry flocks of New Jersey was diagnosed as Newcastle disease[10 11]. Later in the year, the same diagnosis was made of disease among chickens in New York, Massachusetts, and Connecticut. From reports concerning the disease in these states, it appears that it corresponds to avian pneumoencephalitis in its clinical aspects or, in other words, that the disease termed avian pneumoencephalitis in California is the same as that termed Newcastle disease in New Jersey, New York, Massachusettts, and Connecticut. The source of the infection in New Jersey has not been determined. It seems improbable, however, that it has jumped from the West Coast to the East Coast without having occurred in any of the intervening states. It is a reasonable presumption that it may have occurred and escaped recognition in other parts of the United States and may have been present on the East Coast for a considerable period before it was identified, since diagnosis of the disease from symptoms alone is usually uncertain and is practically impossible in many instances. In fact, we have evidence that, during 1943, the presence of infection in a number of flocks was not even suspected because it occurred in a subclinical form. Added evidence of the occurrence of unrecognized infection is provided by the report by Minard and Jungherr[12], in 1944, of the demonstration of pneumoencephalitis virus (California strain) neutralizing antibodies in highly significant concentrations in the serum of chickens of the Connecticut Agricultural Experiment State flock, which was not known or suspected to have been infected with the virus.

Survey to Determine Distribution of Diseases Advocated

The presence of the disease on both coasts caused it to be given prominence in the discussions of animal diseases control at the December, 1945, meeting of the United States Livestock Sanitary Association and Conference of Chief Livesock Sanitary Officials. An important outcome of these discussions was a recommendation that a nation-wide survey be made to determine if the disease may be, or has been, present in areas other than those in which it has already been identified.

Diagnosis of Disease often Difficult

As has already been indicated, natural infection with pneumoencephalitis may escape recognition because of the scarcity of cases showing diagnostic symptoms or lesions. In fact, our experience has been such that we do not feel secure in making a diagnosis in the field unless a reasonable number of birds in an affected flock exhibit typical nervous symptoms. Since, in a majority of the outbreaks which we have observed among chickens more than 3 months old, there were no cases with nervous symptoms, we have found it necessary to rely on the results of laboratory procedures to establish a diagnosis. Formerly, we depended upon isolation of the virus in em-

bryo culture but at present are employing serologic tests and the inoculation of recovered birds with a challenge dose of virus. We consider these methods equally dependable and usually less time-consuming. The wisdom of this procedure has been shown by the numerous instances of failure of our laboratory studies to confirm tentative field diagnoses of pneumoencephalitis. This inability to readily recognize pneumoencephalitis would be a handicap to the prompt and intelligent application of control or eradication programs by livestock disease control officials.

MODE OF SPREAD OF DISEASE UNDETERMINED

A still unknown and important factor of the pneumoencephalitis problem is the means by which it is spread from farm to farm and to new districts. The fact that chickens, turkeys, pheasants, California quail, and chucker partridges have been proved susceptible suggests that the virus may have a wide range of bird hosts, but thus far no infection has been detected in the wild birds which are always found in poultry yards. Adult chickens of recovered flocks could be carriers of the virus but have certainly not been an important factor in California because there is so little transfer of adult stock from one farm to another. Baby chicks have not as yet been incriminated as carriers of the infection within California or to other states, even though large numbers of them have originated in districts in which the disease has been enzoötic and undoubtedly many of them were hatched from eggs coming from flocks in which the disease had previously occurred.

RESULTS OF VACCINATION EXPERIMENTS

Experiments in the control of pneumoencephalitis with vaccine prepared from infected chicken embryos were started at the University of California[13,14], in 1942, soon after the embryo propagation of the virus had been accomplished. After much data favorable to vaccination had been accumulated by a series of laboratory experiments, the work was transferred to poultry farms to determine the effectiveness of vaccination in protecting chickens against natural infection. These field trials were conducted on a large scale during 1943, 1944, and 1945, on farms located in districts in which the disease was enzoötic and on farms on which the disease had occurred. The procedure was to vaccinate a little more than half of the pullets in each flock, the remainder serving as nonvaccinated controls. In 1943 and 1945, the disease was of such a mild nature that little information of significance was obtained. In 1944, however, the disease occurred in an exceptionally virulent form and the vaccine was put to a severe test. The vaccinated portions of the flocks did not exhibit complete protection, but they did go through the outbreak with relatively small loss from death. In addition, the effect of disease on egg yield was lessened to the extent that vaccination was considered worthwhile from that standpoint alone. We believe, therefore, that the results of our field trials demonstrated that the vaccine, even in its present imperfect stage of development, offers a highly effective agent for controlling the disease. Furthermore, vaccine of greater effectiveness can be regarded as a reasonable expectation since experiments in that direction are yielding encouraging results. Advantageous features of the vaccine are that it neither contains virus in an infective form nor produces any observable reaction in the birds and, therefore, can be freely used on farms on which the disease has not occurred without danger of introducing the infection or otherwise harming the birds.

PNEUMOENCEPHALITIS VACCINE PRODUCED COMMERCIALLY

Pneumoencephalitis vaccine became available from a commercial source in April, 1945, and was compared with our vaccine in some of our field trials of that year. This vaccine differed in certain of its constituents from the university vaccine and was administered in a single dose instead of two as had been our practice. Disease severe enough to produce a measurable adverse effect occurred in only 2 flocks. No deaths occurred in these flocks, but egg production was affected to the extent that comparisons in this respect could be made between the vaccinated and control groups. The amount of data obtained is too small to warrant definite conclusions regarding the comparative effectiveness of the two types of vaccine. The results do indicate however, that the pullets which had been given two doses of university vaccine were appreciably more resistant to the disease than those which

had been given a single dose of the commercial vaccine or the nonvaccinated controls. It is our opinion that the seeming difference in the effectiveness of the two vaccines is related to the number of doses of each that were given, rather than in differences in their composition.

It was late in April, 1945, when the commercially produced vaccine became available to poultrymen. It was used on approximately 170,000 chickens, the majority of which were located in the poultry district in which our vaccination field trials were conducted. The number of birds vaccinated, although large, is small in comparison with the number which were vaccinated for chicken pox and laryngotracheitis. The various reasons given by poultrymen for nonuse of the pneumoencephalitis vaccine were:

1) The vaccine was not available until all other vaccinating had been done and the owner did not want to handle the flock again. (In our field trials, the birds were usually vaccinated for pneumoencephalitis and chicken pox or laryngotracheitis at the same time.)

2) Lack of confidence in the vaccine because it was different from the university vaccine and particularly because it was given in 1 dose instead of 2. (Reports of the results of our vaccination experiments which the poultrymen had read state that 2 doses are more effective than 1.)

3) The cost of approximately 7 cents a bird was regarded as too high.

4) The flock owners did not feel that their past losses from the disease had been serious and, therefore, they were willing to take a chance another year.

It is our impression that the last named is the main reason that the vaccine was not more extensively used.

SUMMARY

1) Avian pneumoencephalitis has been present in California since 1935 or earlier, but it was not recognized as distinct from other diseases of poultry in the United States until 1941. In that year, the cause was found to be a virus unrelated to the viruses of the clinically similar respiratory diseases, infectious laryngotracheitis and infectious bronchitis.

2) The major loss caused by the disease has been from temporarily retarded development and also reduced egg yield if the chickens had reached laying age when affected. The disease, however, did cause high mortality in a considerable number of flocks of growing chicks, in 1941 and 1942, and of laying pullets, in 1944.

3) In 1945, the disease appeared on the Atlantic Coast, where it is termed Newcastle disease instead of avian pneumoencephalitis. The reason for this difference in terminology is that, in 1943, the virus of pneumoencephalitis was found to be immunologically related to the virus of Newcastle disease. The clinical aspects of the disease in the United States, however, differ widely from those of Newcastle disease as given in reports concerning it in other countries.

4) The diagnosis of pneumoencephalitis, in many cases, requires special laboratory procedure because, in a majority of outbreaks, the affected chickens do not show symptoms and lesions characterisctic enough to differentiate it from certain other poultry diseases. For this reason, the disease may have occurred but escaped recognition in areas other than those in which it has been identified. A nation-wide survey to determine if this has happened was advocated by the Committee on Transmissible Diseases of Poultry, of the U. S. Livestock Sanitary Association, in December, 1945.

5) A vaccine prepared from chicken embryos infected with the virus has been subjected to extensive laboratory experiments and field trials. The results of the latter are considered satisfactory enough to justify the conclusion that vaccination offers a highly effective measure for controlling the disease on farms, although it does not give complete protection against it. An advantageous feature of the vaccine is that it does not contain virus in an infective form and therefore cannot be the means of introducing the disease onto a farm.

6) A commercially produced vaccine which became available to poultrymen in April, 1945, was not used as extensively as anticipated. The main reason for this is believed to be that flock owners did not feel that their past losses from the disease had been serious enough to justify the expense.

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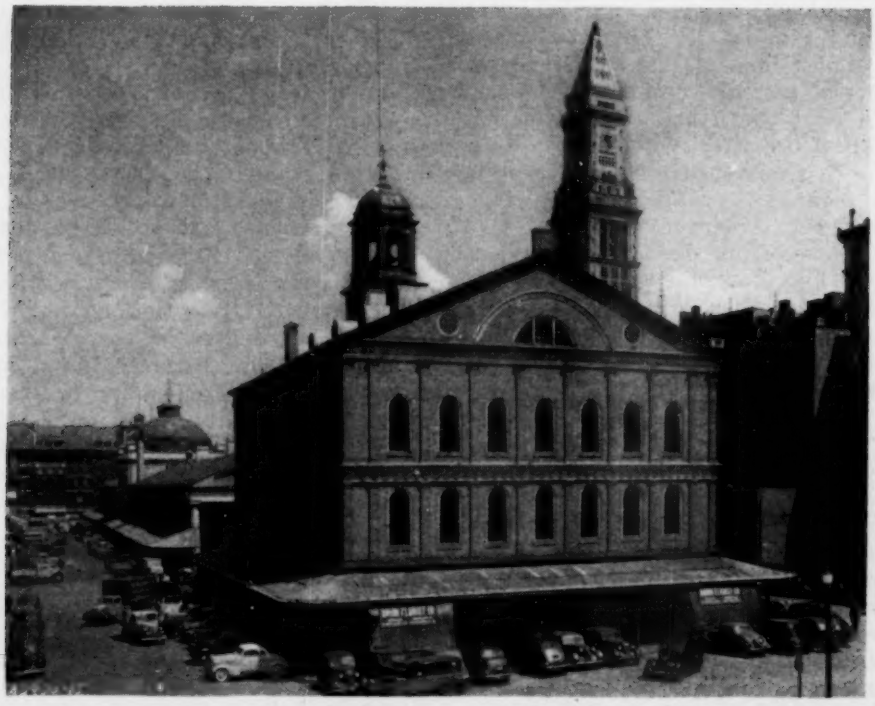
Good pasture saves 40 to 50 per cent of the supplements required for growing pigs, according to Illinois trials.

Butter

National production of creamery butter in 1945 was the lowest of any year since 1923, and each individual's share was only about 11 lb. But anyone who got that much was lucky, because the armed Forces took a big slice of the production. Normally, there is available about 1.5 lb. per person per month, but last year this dropped to less than 0.9 lb. Ceiling prices on butter with none on cream led to diversion into other channels.—*National Dairy Council, Feb. 22, 1946.*

A Kentucky veterinarian recently told an audience about a county where a program for the control of internal and external parasites among dairy cattle resulted in a saving of one million dollars to the cattle owners.

Historic Spot in Boston



Faneuil Hall, built in 1742 by Peter Faneuil and given to Boston as a town hall, burned in 1761 but was rebuilt in 1763. The center of the revolutionary movement, it was used by British officers during the siege of Boston as a playhouse. It houses historic paintings, portraits, an armory, and a military museum.

Canine Chorea Due to Striocerebellar Degeneration of Unknown Etiology

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THE ELUCIDATION of the mechanisms of the clinical dyskinesias has been not a little obstructed by the experimentalist's inability to reproduce these phenomena in the laboratory.

The energetic efforts of the clinical observer and neuropathologist have provided a wealth of information which, supplemented by many valuable anatomic and physiologic investigations, is most stimulating. However, a conviction that one or another of these points of view is likely to elucidate the understanding of the fundamental mechanism of the dyskinesias does not seem to have generally arisen. The present, urgent necessity of research in the dyskinesias is a technique for the experimental reproduction of motor dysfunctions of a type at least resembling those seen in man.

The opinion has been offered that it is futile to search for, or to attempt to produce, such phenomena in animals, since their neural arrangements are not susceptible to these dysfunctions. The fact remains, however, that animals do exhibit dyskinesias which, if one is sufficiently familiar with their normal behavior and allows for somatic differences, bear a certain degree of resemblance to some conditions seen in man. It is not remarkable that the medical investigator rarely encounters such disorders, for the circumstances which are likely to produce them, as well as the dyskinesias themselves, are not compatible with the struggle for survival, even in such relatively protected environments as zoölogical collections. Still, they are occasionally encountered by the experimenter (Richter and Klüver[1], Richter[2]), more commonly by the animal dealer, and frequently by the veterinarian.

Perhaps the most carefully protected animal, and almost the only one long preserved in a condition of ill health, is the dog whose dyskinesias are common indeed. Most of such conditions are attributed to infection with the virus of Carré (canine distemper) or to subsequent lesions produced by such infection. The great majority of these dyskinesias fall into the category called "chorea" by the veterinary profession. This term is generally applied to more or less localized, clonic, muscular contractions rather than to fragments of complex movements designated by the same name in the human being. Since "veterinary chorea" is not well defined, it cannot be stated that all canine chorea is due to distemper. According to Goldberg and Volgenau[3], "chorea, or clonic spasms of muscles, was of very frequent occurrence" in 150 cases of naturally occurring distemper brought to the clinic of the New York State Veterinary College, Cornell University, during 1923-25. The incidence of all forms of neurologic signs was about 50 per cent (73 cases) in the total series. This indicates a much higher incidence of neurologic manifestations than the 10 per cent reported to have been encountered in experimental distemper.

Studies upon the neuropathology of canine distemper commonly reveal changes of a nature usually found in virus infection of the central neural system, notably widespread perivascular infiltration, or even hemorrhage, diffuse cell degeneration and, later, gliosis[3]. Inclusion bodies occur but in the majority of cases of canine distemper are not always found. The condition of the neural system, in cases not exhibiting nervous symptoms, is not well known. The neural system is frequently attacked after other symptoms of the disease are well established or even diminished. In some cases, neurologic derangements are the only symptoms noted.

The present communication is concerned with a case of canine chorea which presented a number of interesting considerations. It emphasized the need of careful definition of the symptomatology of canine chorea. It was a case so diagnosed in which the association with distemper,

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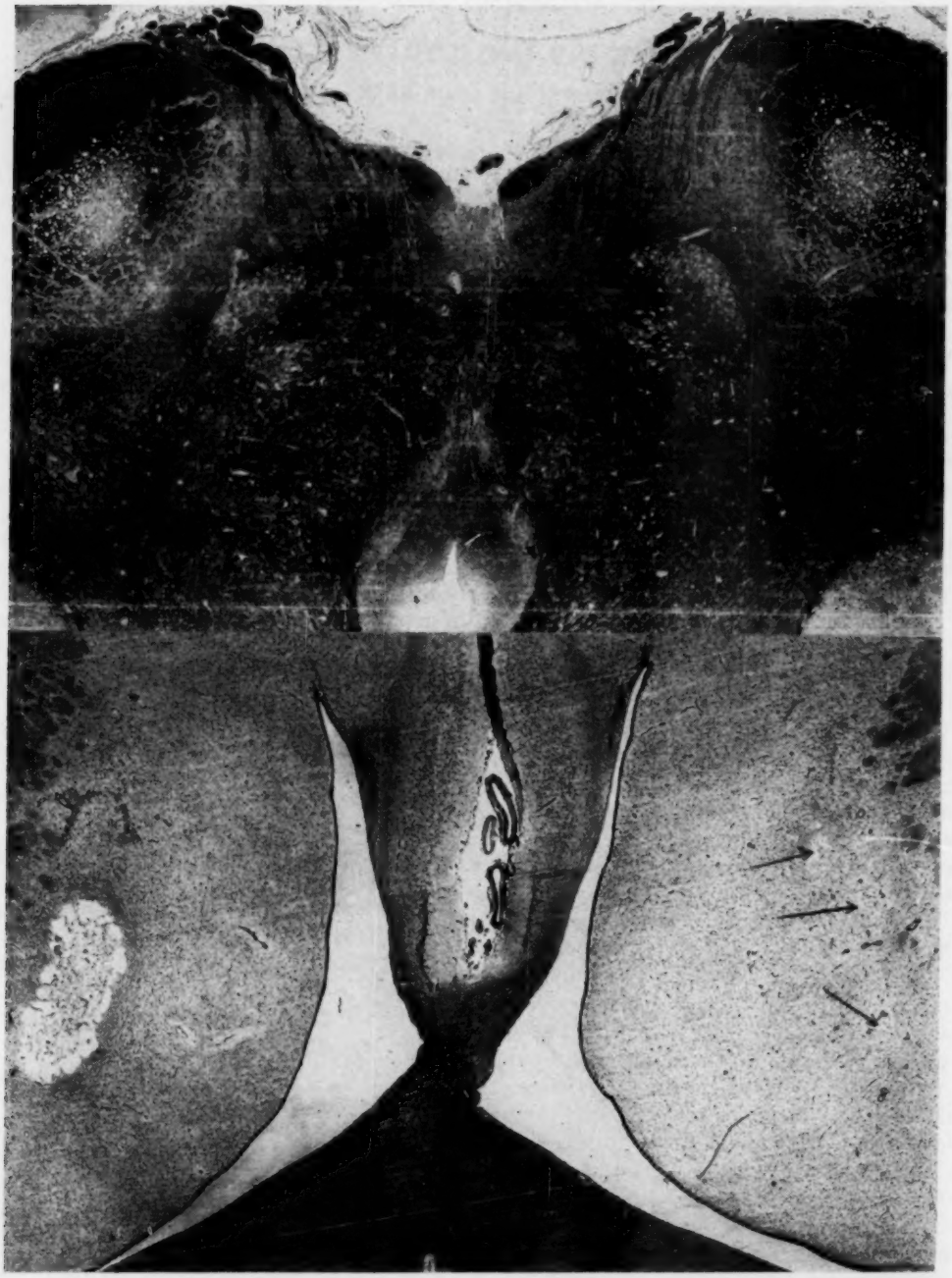

Fig. 1 (Top)—Hematoxylin and eosin coronal section through heads of caudate nuclei showing symmetrical areas of bilateral necrosis. On the right, the degree of cavitation is much more marked than on the left but the same area of the left caudate is involved. x9. (Bottom)—Weil coronal section through mesencephalon and showing bilateral necrosis of substantiae nigrae. x9.

although existing, may have been casual or operating through a heretofore unemphasized mechanism and, finally, one in which the neuropathology though clearly defined was of a different nature from that which is usually encountered in distemper. Whatever was the cause of the condition, the association between the symptomatology and neuropathology (which was that of striocerebellar degeneration) was definite. The case may be confidently presented as the syndrome of canine striocerebellar degeneration.

The animal, a male Kerry Blue Terrier, was purchased from kennels in Shrub Oak, N. Y., when about 3 or 4 months old. He was kept in an apartment and, subsequently, in a private home for some months until being brought to Shefford S. Miller, D.V.M., of Larchmont, on Oct. 11, 1941, for antidistemper vaccination. Subsequent inquiry failed to disclose any notable contact of this animal with carbon monoxide. No previous history of specific diseases existed, but the owners were of the opinion that the animal had always been "somewhat uncertain on its legs."

When examined on October 11, the animal showed no obvious abnormalities and was injected in the superficial fascia of the left thorax with 5 cc. of a standard, commercial, formolized, 20 per cent phosphate-buffered, saline suspension of spleen, kidney, and lung from infected puppies. At the same time, a Setter pup was similarly injected, presumably with vaccine of the same serial number. On October 20, both dogs were again seen. The Kerry showed incoördination of the hind limbs but the Setter was sound and its injections (a second dose of vaccine ten days after the first, followed in two weeks by 10.0 mg. of desiccated spleen tissue containing live distemper virus) were continued without ill effect. It is presumed that the 2 animals had been in frequent contact prior to October 11, as well as October 20.

When seen by the present writers, in the spring of 1942, the animal presented a well-nourished appearance and was standing with head hanging low, forefeet together, and hind limbs abducted and advanced close to the forefeet. The tail was held between the legs and the caudal half of the vertebral column was curved ventrally, bringing the pelvis at a much lower level than the shoulder girdle. There were no abnormal movements until the animal attempted to alter its position or the peculiar stance was passively disturbed. Under such circumstances, a violent ataxia seized the hindquarters and spread to the rest of the body. Clonic contractions of the flexors of the spine pulled the hind legs forward and displaced the center of gravity so that the animal tended to pitch upon its brisket and muzzle. Since the hind legs did not come forward evenly and smoothly, there was also a lateral displacement of the center of gravity with attempts to throw out the forelegs to offset the side-to-side displacement.

On April 21, 1942, the animal was removed to the laboratories of the Department of Neurology and observed over a period of six days.

There was a very slight pupillary inequality, the right pupil being the smaller. Both reacted well to light. There was no nystagmus. Ophthalmoscopic examination showed no cupping at the nerve head, nor any evidence of atrophy. The retinal vessels were full and tense but there was no tortuosity. There appeared to be some evidence of exudate lateral to the papilla, the edge of which was irregular in the manner sometimes seen in renal or pancreatic disease. Fasting blood sugar was 100 mg. per cent.

The animal did not exhibit any ataxia or spasmodic movements while lying quietly. It generally lay on the right, suggesting a lessened sensibility on that side, but would also lie on the left. It was never observed to sit but either stood or lay. Rising was difficult and was begun by elevating the forepart of the body. In this act, the left foreleg frequently buckled at the radiocarpal joint. It was only with great difficulty, and after several trials, that the hindquarters were finally elevated. In standing, the animal leaned toward the right and placed more weight upon each of the extremities of the right side than upon the corresponding left members. The foreshortened and widened base, noted above, were characteristic of the standing posture which was unsteady and interrupted by violent anteroposterior, seesawing movements. Most of the dyskinesia occurred in the hindquarters but a diminishing amount was visible as one proceeded rostrally and some even occurred in the muscles of the neck. There was slightly greater resistance to passive movement of the head toward the left than right. As

the animal attempted to move forward, clonic contractions of the vertebral musculature prevented a nice balance of synchronized movement between the hind and forelegs, and the forward and backward pitching movement was aggravated. All legs, especially the front, showed overstepping. If the hind legs were elevated from the ground and supported, no dyskinesia appeared in the forepart of the body.

When the animal was placed upon its back, the forelimbs were flexed and the hind strongly extended.

The reflex tendon jerks were forceful and rapid. Their thresholds were lowered but their reflexogenous zones greatly constricted.

On April 24, motion picture studies were made. These showed that while the hind legs were not always extended, but often flexed at the hip and femorotibial joint, the propulsive qualities of the disorder tended to straighten the hind legs. These were not alternately flexed and extended but tended to straighten simultaneously. The animal then had difficulty in bringing but one or the other leg forward. The animal never moved backward (such a deficiency is encountered in striatal damage[5]) and tended to brace itself by placing its brisket against a solid object to offset the progressive, propulsive tendency. Good placing reactions were present in the forelimbs but not in the hind. If the forepart of the animal was suspended, with the hind legs hanging free, no ataxia was observed. If the animal was stood upright upon the hind legs, these went into extension in the first part of a "leaping phenomenon"[6] (*see* also analysis of mechanism of this phenomenon[7]). There was no ataxia or tremor while the animal was lying on its side.

Blood and cerebrospinal fluid samples were sent on the day the animal was killed, (April 27) to the laboratory of Dr. Webster at the Rockefeller Institute. A report re-

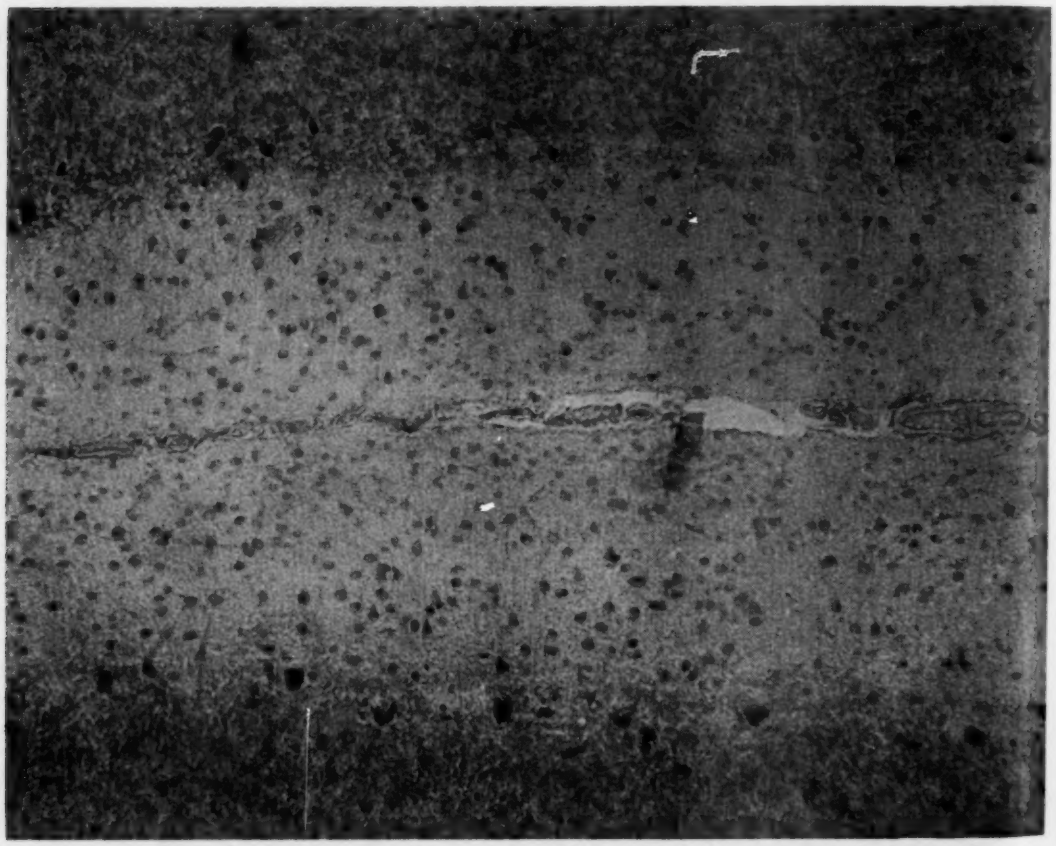

Fig. 2—Nissl section through cortex of cerebellar vermis showing loss and displacement of Purkinje cells. x120.

ceived from Dr. J. Casals-Ariet, on June 8, disclosed that tests for complement-fixing antibodies against antigens of Eastern and Western equine encephalomyelitis, St. Louis encephalitis, and lymphocytic choriomeningitis were all negative. The cerebrospinal fluid was also negative when tested in mice.

The neuraxis as well as several dorsal root and sympathetic ganglions were removed. Pieces of cerebellum and cord were stained by the Cajal method. The neuraxis itself was stained by hematoxylin and eosin, the Mahon, and also cresyl-violet methods.

HISTOLOGIC

Below the level of the substantiae nigrae, no abnormalities could be detected in the myelin series, but the mediolateral third of the reticulated part of the caudal end of each substantia nigra (fig. 1, bottom) showed numerous small holes which, as one progressed rostrally, developed into a definite lacy defect in the medial part of the reticulated portion of each substantia nigra. No further abnormality was visible until one reached the level of the columns of the fornix. At this level, the heads of the caudate nuclei were beginning to appear and the dorsoventral third of the lateroventral side of each of these gradually developed symmetrical necrotic areas (fig. 1, top) which enlarged forward into the heads of the nuclei. The subcallosal fasciculi were undegenerated.

Nissl and hematoxylin - eosin sections showed very extensive local changes in the caudates, but the parts of the caudate nuclei not directly involved in the necrotizing process were entirely normal and showed good large and small cells. There was no evidence of perivascular infiltration nor of inclusion bodies. The vessels in the areas of necrosis showed some proliferative activity. There was no apparent abnormality in the cytology of the thalamus, globus pallidus, or putamen. The nuclei of the ocular system were intact as were the red nuclei, but the ventral (diffuse) parts of both substantiae nigrae were very deficient in cells. There was no reason to suppose that this was anything but the well-known retrograde degeneration which accompanies striatal lesion. The cells of the nuclei of the pons Varolii were intact.

The cerebellum showed a widespread loss of Purkinje cells. Most of the cells which were present were displaced into the granular layer (fig. 2) and were abnormal in form and staining reaction. These changes were marked throughout the vermis and lateral lobes but the flocculi were nearly sound. There was also a reduction in the cytologic content and the size of the cells of the mediolateral third of each inferior olive. The dentate and roof nuclei showed a diffuse cytologic loss as well as shrinkage and pleomorphism of their cells, but these nuclei showed very many good cells. The nuclei of the cranial nerves were not abnormal and the cell groups of the spinal cord showed no pathologic condition.

Silver sections of the cerebellar cortex showed pericellular baskets about the spaces where the cerebellar cells should have been, but there was, of course, a reduction in the fiber content of the molecular layer due to loss of Purkinje dendrites. The dendrites of the Purkinje cells which were present were pale, swollen, and retracted so that the whole cell appeared wilted and sunken into the granular layer. Under these circumstances, it was difficult to identify climbing fibers (the normal origin of which is in doubt[9]) but it was thought that fibers of this type were still detectable on the collapsed dendrites. Mossy fibers (which have their origin from the granule cells) were definitely present, as were their bifurcated axons in the molecular layer.

DISCUSSION

In view of the absence of inclusion bodies, perivascular infiltration, the negative course of the companion animal, and the peculiar localization of lesions in the present case, it would be difficult to sustain the opinion that the etiology was dependent upon neural infection by the virus of distemper. Several hypotheses may be brought forward. The disorder might be thought due to neural infection by an accidental virus either present in the vaccine or independently contracted. It could be conceived to have been caused by physiologic phenomena (anemia, hypoglycemia, hepatic dysfunction, anaphylaxis) set off by the vaccine. Another possible explanation would postulate the effect of a toxic substance in the vaccine (manganese) or accidentally acquired (carbon monoxide, thiophen). Lastly, one might conceive of a nutritional deficiency as the responsible factor.

Certain of the above mentioned hypotheses need not long detain us. The same

reasons which suggest the unlikelihood of direct neural infection with the virus of Carré argue against the possibility of such infection by other viruses. Moreover, we have seen that specific tests for the detection of the activity of the most common of these viruses (no tests were conducted for fox encephalitis or rabies) were negative. The clinical course of the condition argues against the possibility of rabies.

Spontaneous, and presumably virus, infections may attack the striatal and cerebellar systems but the resultant pathologic process does not seem closely to resemble what has been described for the present case. Thus Richter and Klüver[1] gave an account of a monkey with striatal degeneration with perivascular hemorrhages there and cytologic changes in the dentate nucleus and horn of Ammon, which lesions they explained upon the basis of "general pathoclisis." The onset was spontaneous and the case ran an acute course with symptoms of functional decortication due, no doubt, to pressure upon parts adjacent to those involved in the actual pathologic process. There were no hepatic changes. The patient died before any specific tremors or ataxias could be observed but Richter[2] subsequently reported another monkey in which severe ataxia and periodic, widespread outbursts of involuntary movements occurred two months after inoculation with a brain suspension from a human case of encephalitis. Richter regarded this inoculation as irrelevant. Within four days, the involuntary movements had almost disappeared and the ataxia was also decreased. The animal was not kept longer. Its brain showed necrotic striatal lesions of an inflammatory type with infiltration. There was no cerebellar lesion and only slight involvement of the thalamus. Another animal similarly treated showed similar pathologic processes but no dyskinesia; and a third which had been previously reported by Bucy and Klüver, and which had sustained temporal lobe operation without

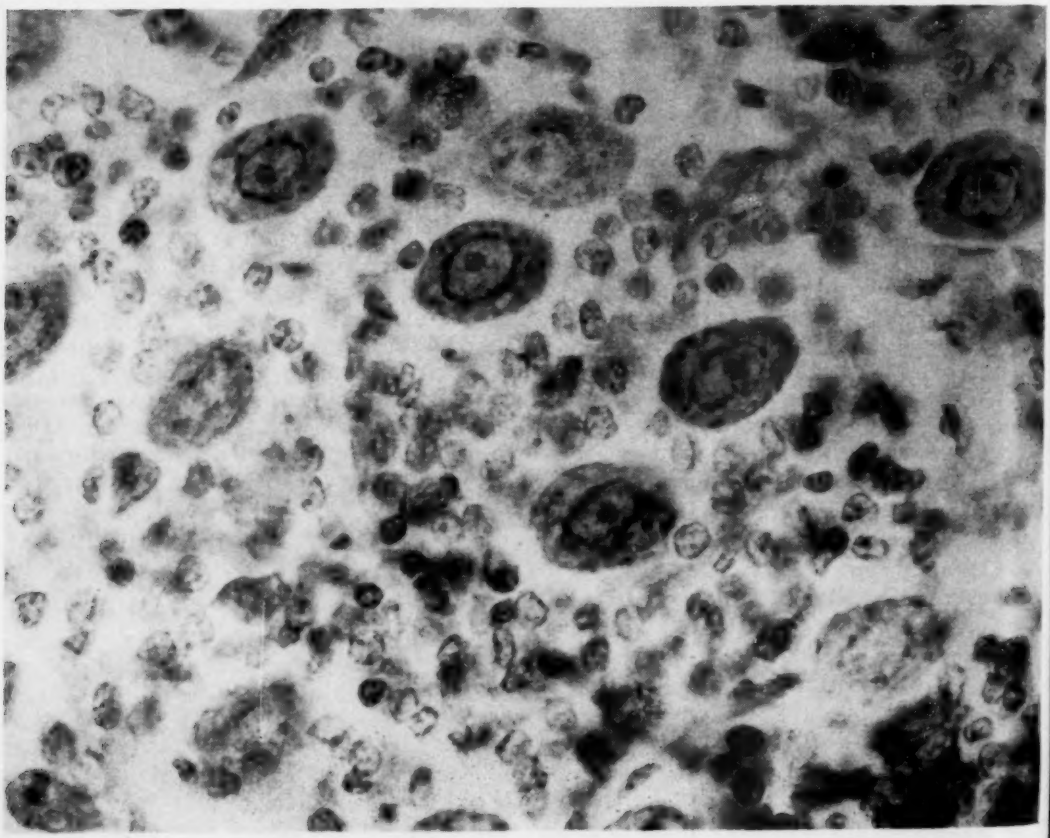

Fig. 3—Nissl section through striatum of a dog injected intramuscularly with whole bile. x1200.

being subjected to exposure to virus, also showed similar pathologic conditions but no dyskinesia.

Inquiring into the possibility of manganese poisoning, an analysis of the metals present in the mill employed by the manufacturer of the vaccine disclosed an appreciable amount of this element. However, it is doubtful that more than 20 mg. of manganese could have been introduced in this manner. In our own laboratories, 3 monkeys intraperitoneally injected every other day with an average dose of 20 mg. (15 mg. for five months, 20 mg. for two months and 25 mg. for seven months) of manganese chloride solution for a period of fourteen months failed to develop any abnormal movements or neuropathologic change. Spectroscopic analyses of blood from these cases showed that the manganese rapidly entered the blood, but apparently little, if any, passed the hemato-encephalic barrier and it seems doubtful that any but the respiratory is significant as a route of dangerous degrees of absorption of manganese.

Close inquiry into the circumstances surrounding the care of the animal failed to reveal any possibility of exposure to carbon monoxide or thiophen. It was not kept in a garage nor, apparently, confined to a cellar. Of course, the possibility of an obscure intoxication is difficult to eliminate. The neuropathology of dietary deficiencies is quite different from what has been found in this case.

We are now required to investigate the possibility of an unusual physiologic reaction. Wharton and Wharton[10] have concluded that the body response to distemper virus is essentially an acute anemia and hypoglycemia. They have also found bile salts in the urine of injected dogs, though they discard the possibility of extensive liver damage.

Noninflammatory lesions of the neural system have been described as occurring in both anoxemic and hypoglycemic states. The present case showed no evidence of either of these conditions while under observation but, of course, such situations may have existed and disappeared. The same difficulty is encountered in attempting to evaluate the possible rôle of disturbed liver function.

Crandall and Weil[11] described bilateral, symmetrical necrosis of the corpus striatum in 1 of 4 dogs in which the common bile duct had been ligated. The remaining fragments of the corpus striatum showed perivascular hemorrhages. In the present case, there was no evidence of perivascular hemorrhage nor was there any reason to suspect liver damage. Moreover, it is not clear why only 1 of Crandall and Weil's animals showed such damage. The remainder exhibited generalized cytologic changes, including swelling of the cells, vacuolization, and liquefaction, changes which the authors attributed to a hepatogenous toxic substance. Such changes can be reproduced by the injection of whole bile into the otherwise intact animal. Figure 3 exhibits changes we have produced in this manner in the striatum of a dog. Marked alterations also existed in the inferior olive and cells of Purkinje.

It is very difficult to determine what importance should be placed upon the possible neuropathogenicity of anaphylactic reactions as such. Much evidence has been brought forward to indicate that noninflammatory degenerative changes may be induced by anaphylactic reactions, but the limits and circumstances of these processes have not been clearly defined, nor is it certain that they uniformly occur. It was Dr. Miller's assumption that the present animal had been in a susceptible state (as indicated by the previous instability), and that the vaccination had precipitated a neurologic anaphylactic crisis. Whether such a presumptive reaction is to be considered as primarily parenchymatous or whether it is secondary to a general vascular reaction, manifesting its permanent effects in areas with lowest factors of circulatory safety, remains to be elucidated.

CONCLUSION

A case of canine chorea has been presented in which the neuropathology is that of striocerebellar degeneration rather than that which is usually seen after virus infections. The possible explanations for such a circumstance are (1) that canine chorea is a symptom complex rather than a specific syndrome; (2) that chorea may be caused by factors other than infection with the virus of Carré; or (3) that the virus of Carré may produce at least two different types of neuropathology.

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Less Grain for Livestock

Reducing the number of animals to conserve cereal grain for the human dietary is a measure to be practiced with considerable moderation in the attempt to ameliorate the critical food situations. Extensively employed as a relief program, the inescapable end would be the loss of stupendous poundage of food derivable from wasted roughage (grass, hay, straw, fodder) which would be of no use to the starving millions once the farm-animal population is reduced below its capacity to convert it into edible products. The transformation is not all arithmetic. There is a vast industry — farming — to reconvert. Every shock of corn fodder, every ton of hay, every acre of grass not eaten by animals represents just that much loss to the hungry. Shipping grain from the farm is not as simple a matter as it may seem.

The action of DDT used around inland waters in mosquito control is so manifestly destructive to fish that protective measures may have to be instituted to preserve fish life.

Phytopathologists of the University of Wisconsin discovered the presence of antibiotic substances in spinach juice that inhibit the action of plant viruses.

Master of Public Health— A New Degree

The following list of institutions accredited by the American Public Health Association to give the degree of master of public health (diploma of public health in Canada) for the academic year 1946-1947 is released by its executive board and includes those institutions from which requests for accreditation had been received before Jan. 25, 1946:

Columbia University School of Public Health.
Harvard University School of Public Health.
The Johns Hopkins School of Hygiene and Public Health.
University of California School of Public Health.
University of Michigan School of Public Health.
University of Minnesota School of Public Health.
University of North Carolina School of Public Health.
University of Toronto School of Hygiene.
Yale University School of Medicine, Department of Public Health.

Minimum requirements for institutions to be accredited for the degree of master of public health have been adopted by the Committee on Professional Education of the American Public Health Association, and they cover the institution, the course, and the background study of basic public health sciences and public health practices.

The announcement reads: "Candidates to be admitted for the degree of master of public health (diploma of public health in Canada) may be either (a) holders of the degree of M. D., D. D. S., D. V. M., or equivalent degree, from an acceptable institution; or (b) holders of a bachelor's degree with adequate training in mathematics and the natural sciences, including chemistry and biology; and also qualified in some professional capacity for postgraduate education in public health; and the holders must have, in addition, either (x) professional academic qualifications in engineering, nursing, education, or postgraduate work in other fields of public health; or (y) three years of experience in responsible public health practice." — *Am. J. Public Health, March, 1946.*

Poultrymen use the word "dubbing" for tattooing, for trimming wing feathers, and also for amputating the comb and wattles.

Clostridium Infection in Range Animals

J. F. RYFF, D.V.M., and A. M. LEE, D.V.M., M.S.
Laramie, Wyoming

DUE TO numerous reports of apparent blackleg losses in vaccinated and unvaccinated animals throughout Wyoming, an attempt was made to secure material from such cases and to identify the causative organisms as one means of approach to the problem. In two years, a number of outbreaks of blackleg, or gas gangrene, were studied and, while reports of losses have exceeded those cases where material could be secured, it is felt that these represent an adequate cross section of this type of infection.

The accompanying table summarizes the information secured but, as a number of these reports have an interesting background, a more detailed description of a few follows.

Case 11 consisted of muscle tissue from a 2-year-old ewe, apparently dead from blackleg. This ewe had recently lambed, became lame in one hind leg, and died in about twenty-four hours after symptoms were noted. The flock consisted of approximately 80 head which had lambed around sheds and corrals. About 6 or 7 of the ewes were lost; some died after lambing, and others became lame and died shortly before parturition. Ten years previously the same trouble was encountered; after vaccination against blackleg and moving, no new cases developed.

Case 12 is typical of many instances where the owner fails to recognize that blackleg vaccination is the best assurance of its nonappearance, even if the area is seemingly free from the disease. The material investigated came from a dairy herd of some 50 head. A yearling steer died suddenly and, when skinned out, the musculature of the brisket and neck was found to be dark and hemorrhagic. However, death was attributed to the animal falling amongst rocks in the mountains. Three weeks later, a heifer became affected; veterinary assistance was called in, and the herd vaccinated for blackleg. Before the vaccine could become effective, another heifer succumbed with extensive lesions in the muscles. The owner stated that no blackleg had appeared, up until the present instance, in the fifteen years he had resided on the ranch.

In case 15, about 105 young ewes (2 to 3 years old) and only 1 old ewe were lost. Within twenty-four hours of lambing, the ewe started to strain, and the vulva and anus became swollen and darkened. Several hours later the ewe was down, and a few hours later she died. Nearly all the affected sheep succumbed in the period between twenty-four and forty-eight hours after parturition. Decomposition was rapid after death had occurred. Although the spring was wet, comparatively dry, clean quarters were provided for lambing. No significant loss was observed in the lambs, although they were docked during this period. Two ewes that were subjected to autopsy showed a considerable degree of hemorrhage about the brisket and the ventral part of the neck. The condition was self-limiting and had ceased when veterinary assistance was called in. No trouble was reported the following year.

In case 22, we were asked to check a number of muscle specimens from 3 head of cattle for blackleg, although the veterinarian also thought hemorrhagic septicemia might be responsible for the losses. Before this investigation was completed, we learned that 39 heifers had been purchased and had been guaranteed as being vaccinated against blackleg and hemorrhagic septicemia. With 22 of the rancher's own heifers, the animals were spayed. On the following day, the first animal died, and within a short time a total of 11 had succumbed. During life, crepitating swellings were present beneath the hide. After vaccination with blackleg bacterin, no new

The investigation reported in this paper is in connection with a project of the Wyoming Agricultural Experiment Station, at Laramie, Wyo., and is published by permission of Director J. A. Hill.

Dr. Lee is professor of veterinary science and bacteriology and head of the Department of Veterinary Science, University of Wyoming. Dr. Ryff is assistant professor and assistant veterinarian in the same department of the university.

Table I—Results on Twenty-five Specimens Examined for Clostridium

Case	History	Organisms Isolated
1	Field diagnosis—"blackleg".	*Cl. chauvei.*
2	Long yearling, never vaccinated; temp. 102 and 106 F. on 2 occasions; died 24 hrs. after hard swelling noticed.	*Cl. chauvei.*
3	9 calves found dead in October; had been vaccinated against blackleg in July; muscle not typical of blackleg.	*Cl. chauvei,* *Cl. perfringens.*
4	4-year-old purebred Hereford cow recently purchased.	*Cl. chauvei.*
5	Yearling heifer found dead with tentative diagnosis of blackleg or malignant edema. Vaccinated as small calves with double amount of 1-cc. dose product.	*Cl. septicum.*
6	2 steers lost; tentative diagnosis of blackleg.	*Cl. chauvei,* *Cl. sporogenes,* *Cl. perfringens.*
7	Diagnosis of hemorrhagic septicemia; muscle sent in for examination, as "didn't look so good."	*Cl. septicum.*
8*	Calves dying of blackleg.	*Cl. septicum.*
9	Calves vaccinated against blackleg when branded and when weaned; 2 steers lost from group. Owner suspicious of blackleg. No further losses after revaccination and moving. Muscle not typical of blackleg.	No pathogenic anaërobic spore former isolated.
10	Calves vaccinated in November and February for blackleg, followed in each case by hemorrhagic septicemia bacterin 2 weeks later. Vaccinated in February again with chauvei-septicum bacterin; 15 calves lost off and on, plus 3 immediately before and 2 shortly after last vaccination.	*Cl. chauvei,* *Cl. septicum.*
11*	2-year-old ewe, apparently dying of blackleg after lambing.	*Cl. chauvei,* *Cl. tertium,* *Cl. perfringens.*
12*	1 1/2 year-old heifer dying of blackleg.	*Cl. chauvei,* *Cl. tertium.*
13	Young steer apparently dying of blackleg.	*Cl. chauvei.*
14	History suggestive of hemorrhagic septicemia-like disease.	*Cl. septicum,* *Cl. sphenoides,* *Cl. bifermentans.*
15	Ewes dying after lambing.	*Cl. chauvei,* *Cl. septicum.*
16	1 of 6 unvaccinated animals dying.	*Cl. chauvei.*
17	Vaccinated against blackleg about middle of June; 2 calves found dead on range in September.	*Cl. septicum.*
18	8-month calf found on pasture with crepitation of muscle tissue.	*Cl. chauvei,* *Cl. septicum.*
19	Yearling heifer in feedlot with typical symptoms of blackleg before death; no record of vaccination.	*Cl. chauvei.*
20	Suspected malignant edema or tetanus in dog.	No pathogenic anaërobic spore former isolated.
21	Vaccinated against blackleg in May or June; 3 calves lost in February; "malicious edema" suspected.	*Cl. chauvei.*
22	A number of specimens from animals dying from suspected blackleg.	*Cl. septicum,* *Cl. paraputrificum,* *Cl. sporogenes,* *Cl. bifermentans.*
23	Ear from unvaccinated heifer with symptoms not entirely typical of blackleg.	No pathogenic anaërobic spore former isolated.
24	Lamb dying with symptoms of blackleg.	*Cl. chauvei.*
25	Cow succumbing to infection after abortion.	*Cl. perfringens,* *Cl. sporogenes.*

*Specimens secured through courtesy of Montana Livestock and Sanitary Board.

cases developed, although all of the sick ones died. This, and the fact that losses were confined to the purchased animals, readily explains why the rancher felt that vaccination of the purchased animals had been misrepresented. Failure to find *Clostridium chauvei*, the blackleg organism, prevented the development of a lawsuit, although *Clostridium septicum* and other Clostridium species were isolated. It is our understanding that the surgery involved in spaying the heifers was under unfavorable conditions, and the logical conclusion is that the loss was due to infection of the operative site.

In 3 cases of a number of instances in which *Cl. chauvei* was isolated, there was a definite history of blackleg vaccination, although only 1 of these cases was uncomplicated by the presence of *Cl. septicum* or *Clostridium perfringens*. This may be out of proportion to the total number of isolations, as more interest would be shown in these cases and they would be more apt to be submitted for examination. We have gone on the supposition that proper usage of a good product is a reliable method of blackleg prevention, but so many factors may influence this, including the actual vaccination procedure itself, that we reserve this topic for a later report. We also hesitate to interpret the clinical importance of organisms other than *Cl. chauvei* that were isolated in combination with it. In some specimens, the type of material was not ideal for blackleg examination and, in others, it was in poor condition when received. These isolations, even of *Cl. septicum*, may therefore simply represent postmortem invasion of the tissues but, on the other hand, they may have some influence on the incidence of blackleg. Breed[1] has indicated this is true of *Cl. septicum*. Without opportunity to clinically examine affected animals, and having to depend upon the too frequently meager description accompanying the sample, it is also debatable whether the Clostridium species (other than *Cl. chauvei*, as in cases 7, 14, and 17) isolated represent more than simply agonal invasion of the tissues. At least a part of those secured in cases 22 and 25, from the histories available, would seem indicated as the causative factor of death.

From the laboratory standpoint, handling of these specimens has resolved into two major problems: isolation in pure culture of the Clostridium species present and their identification. For picking individual colonies, the plate procedure would seem ideal, but in routine practice we have been unable to depend upon it, although various mediums and methods for securing anaërobiosis were used for the development of *Cl. chauvei*. Fresh liver infusion deep agar has not been too satisfactory either. Employment of different peptones, tryptone, tryptose, cystine, tryptophane, etc., has not been of material assistance, although glucose and glycogen have been useful. Reinforcement with veal infusion (as Record and Vawter's formula[2]) has been helpful. In similar fashion, for carrying cultures, the addition of veal, usually as a dehydrated product to fresh liver, has been a marked improvement over the basic von Hibler formula. In identification, we have felt, as have others, that colony form, microscopic appearance either in culture or tissues, and other similar tests cannot be relied upon for the recognition of *Cl. chauvei*, although these criteria may serve as useful adjuvants. We have used Spray's[3], and Reed and Orr's[4, 5] keys and have found parts of both to have advantages. Spray's iron-milk and hydrogen sulfide detection mediums allow of great differentiation, while Reed and Orr's carbohydrate and other mediums allow better growth with consequent better separation. With the mediums and identification procedures mentioned, controlled experiments have not been run, and the foregoing are simply general impressions secured by employing each over a period of time. Neither of these keys have been too satisfactory, frequently because *Cl. chauvei* when isolated has failed to grow well and, hence, to produce the described reactions. In this connection, it might be mentioned that our pathogenic strains of *Cl. chauvei* have uniformly failed to grow in Brewer's liquid medium (Baltimore Biological Laboratory), but we have also hesitated to use this negative characteristic as a means of separation from *Cl. septicum* for obvious reasons. Certain minor modifications have been made to the keys mentioned in an attempt to improve them; of these, the addition of sodium thioglycolate to milk in 0.2 per cent concentration has aided growth. Animal inoculations and immunity tests were also used to verify identification where deemed necessary. Usually a comparatively large num-

ber of strains were isolated to insure that no species would be overlooked.

ACKNOWLEDGMENT

This report would be incomplete without acknowledging the assistance of the many veterinarians who sent us material and case histories. The Wyoming and Montana Livestock Sanitary Boards also coöperated in making this survey.

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[1]Breed, Frank: A Study of Blackleg and Its Complications. J.A.V.M.A., *90*, (1937): 521-528.
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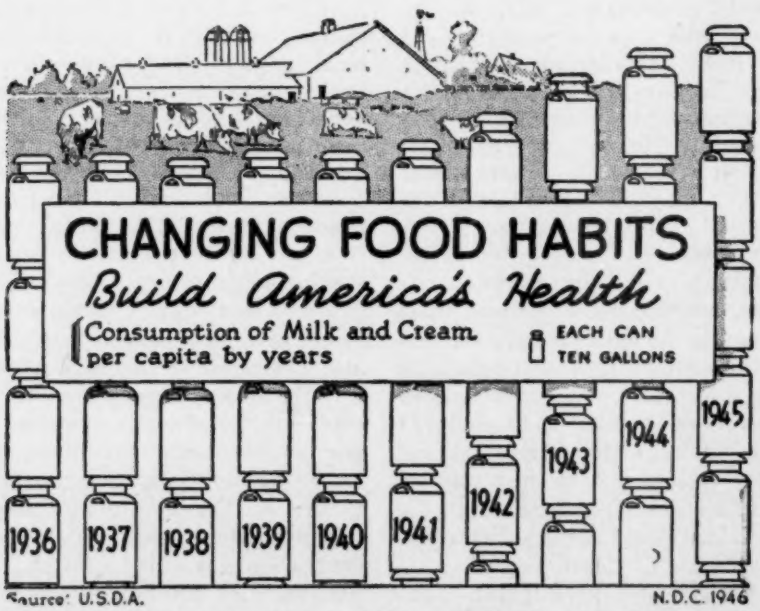
[3]Spray, R. S.: Semisolid Media for Cultivation and Identification of the Sporulating Anaërobes. J. Bact., *32*, (1936): 135-155.
[4]Reed, G. B., and Orr, J. H.: Gas gangrene. Am. J. Med Sci., *206*, (1943): 379-399.
[5]Reed, G. B., and Orr, J. H.: Rapid Identification of Gas Gangrene Anaërobes. War Med. *2*, (1941): 493-510.

Europe's Food Crisis

Shipments of food to Europe in the present emergency, important as they are said to be, can hardly scratch the surface of the situation created by the diabolical schemes of the Nazi party, which have left 500,000,000 people the victims of prolonged hunger. Connoisseurs of agriculture and animal industry see reason to feel less optimistic than the donors of food, bent only on temporary relief of the hungry, meaning the raising of the low caloric diet that is reducing the mental and physical strength of this vast population—the builders of our civilization. Over-confidence in weighing the value of these relief measures can be harmful if not associated with plans for long-range rehabilitation. Europe has not raised a sustaining diet for its people from its own soil for many years. To think of Holland, Denmark, Belgium, Norway, France, *et al.*, as great food providers is erroneous. They sustain their agriculture and livestock on compost and feed imported from other countries; for example, note: 2,000,000 metric tons of rock phosphate, 3,000,000 tons of cottonseed and linseed cake, 8,000,000 tons of concentrates, 500,000 tons of oils and animal fats, and so on. That is, these countries have the food-making machines (soil and livestock) but other countries furnish the fuel to run them.

If we cannot rise to the occasion of helping to rehabilitate Europe to its *status quo ante* in true business fashion, in addition to emergency relief, we are only postponing the arrival of an evil hour for all mankind.



One of the striking changes in American food habits developed during World War II is that of increased milk drinking, according to the National Dairy Council. The average prewar American consumed 340 lb. of milk a year; now the amount has risen to 442 lb. in 1945.

Proposed Code for the Inspection of Human Food

O. W. SEHER, Chairman; M. O. BARNES, M. R. CLARKSON, E. M. LYNN, H. E. KINGMAN

[At the annual meeting of the Executive Board in August, 1945, a motion was passed requesting the AVMA Special Committee on Food Hygiene to outline a basic food inspection plan for the guidance of interested agencies and individuals. The outline was published in the January issue (pp. 25, 26) of the JOURNAL. In accordance with suggestions, the Committee has prepared the following code based on the outline.—The Editors.]

• • •

Food Inspection Act[1]

AN ACT relating to the public health, safety, and welfare, providing for: the establishment of a food inspection bureau; the inspection of articles of human food; the condemnation and destruction for food purposes of diseased, unsound, or otherwise unfit food; the prevention of misbranding and adulteration of food; the issuance of licenses and collection of fees; the adoption of regulations for the administration of the Act; and, penalties for violations of the Act.

BE IT ENACTED BY THE { LEGISLATURE OF THE STATE OF / COMMISSIONERS OF THE COUNTY OF / COUNCIL OF THE CITY OF } ————:

Section 1—Definitions

For the purpose of this Act the following words, phrases, names, and terms shall be construed, respectively, to mean:

a) **Bureau.**—The Food Inspection Bureau established by this Act.

b) **Inspector.**—An inspector of the bureau, authorized by the chief of bureau to do any work or perform any duty in connection with food inspection under this Act.

c) **Licensed Plant.**—Any food handling plant licensed under this Act.

d) **Food.**—Any article capable of being used for human food and which is subject to regulation by the

{ State / County of / City } ————.

e) **Animal.**—Cattle, calves, sheep, swine, goats, and other domestic food animals, including poultry.

f) **Carcass.**—All parts, including viscera, of a slaughtered animal that are capable of being used for human food.

g) **Meat and Product; Meat or Product**—Carcasses, parts of carcasses, meat and products of, or derived from, cattle, calves, sheep, swine, goats, and other domestic food animals including poultry, which are capable of being used for human food.

h) **Person.**—Natural person, partnership, corporation, or other organization, and every officer, agent or employee thereof. This term shall mean either the singular or the plural as the case may be.

Section 2—Administration

a) **Organization of Bureau.**—There shall be organized a Food Inspection Bureau which shall be charged with the enforcement of this Act.

b) **Chief of Bureau.**—The Chief of Bureau shall be a duly qualified veterinarian, graduate of a school approved by the American Veterinary Medical Association.

c) **Inspectors; Qualifications; Appointments.**—The Chief of Bureau shall cause to be appointed such inspectors as may be necessary to carry out the provisions of this Act. Appointees shall meet all applicable civil service rules and regulations: PROVIDED, That veterinary inspectors shall be duly qualified veterinarians, graduates of schools approved by the American Veterinary Medical Association; AND PROVIDED FURTHER, That, other inspectors shall meet such qualifications as the Chief of Bureau may prescribe.

[1]The term "Ordinance" may be substituted throughout for "Act" in the case of county or city enactments.

SECTION 3—LICENSES

a) **Licensee.**—No person shall operate any slaughtering plant, packing plant, wholesale distributing plant, retail market, restaurant, or other food handling establishment unless he shall first have applied for and been granted a license as provided under this Act.

b) **Application for License.**—The owner or operator of each plant or establishment of the kind specified in (a) of this section shall make application to the Chief of Bureau for a license to operate such plant. The application shall be on a form furnished by the Bureau. In case of change of ownership or change of location a new application shall be made.

c) **Granting License.**—The Chief of Bureau shall investigate all circumstances in connection with the application for license to determine whether the applicable requirements of this Act and regulations made pursuant thereto have been complied with. The Chief of Bureau shall grant or refuse the license upon the basis of facts pertaining to the applicable requirements disclosed by his investigation. Each license shall bear an identifying number.

d) **Revocation of License.**—The Chief of Bureau may revoke any license if he determines that any false statement was made in the application or if he finds that there is any failure to comply with the applicable provisions of this Act or regulations made pursuant thereto.

SECTION 4—PLANT CONSTRUCTION AND EQUIPMENT[2]

a) **Construction.**—Every licensed plant shall be constructed and maintained with materials susceptible of being readily and thoroughly cleaned. The plant shall not be located near any source of fly breeding or similar public nuisance. Rooms and compartments used for handling or preparing food products shall be separate and distinct from those used for handling or preparing inedible products. Floors and walls shall be smooth and impervious. An efficient drainage system with approved traps and vents shall be provided. There shall be ample light and ventilation. Suitable dressing rooms, toilet rooms, and urinals shall be provided. Modern hand-washing facilities shall be located wherever necessary to assure cleanliness of all persons handling food.

b) **Equipment.**—Every licensed plant shall provide for proper handling of food and efficient conduct of inspection all necessary tables, benches, receptacles, utensils, and other articles of equipment of such materials and construction as will make them susceptible of being readily and thoroughly cleaned.

c) **Cleanliness.**—The outer premises and all parts of a licensed plant and its equipment shall be kept clean. Flies, rats, and other vermin shall be excluded from such plants.

d) **Water Supply and Sewage Disposal.**—The water supply of a licensed plant shall be ample, clean, and potable and protected against contamination and pollution. An ample supply of both hot and cold water shall be distributed throughout the plant as may be necessary. An adequate and acceptable sewage disposal system shall be provided.

SECTION 5—ANTEMORTEM INSPECTION

a) **Provision for Antemortem Inspection.**—The Chief of Bureau may require to be made, by an inspector, an antemortem inspection of all animals about to be slaughtered. Such inspection shall be made on the day of slaughter. No animal shall be slaughtered without such inspection as the Chief of Bureau may require under this section.

b) **Facilities and Assistance.**—The owner or operator of each licensed plant where slaughtering is conducted shall furnish such facilities and assistance as may be required by the Chief of Bureau to permit the inspector to make his inspections efficiently.

c) **Disposition of Animals.**—Veterinary inspectors shall dispose of animals on antemortem inspection in conformity with such provisions of the appropriate federal inspection regulations as may be adopted by the Chief of Bureau from time to time in his regulations under this Act, whether the animals are released for slaughter, held as suspects, or condemned.

SECTION 6—POSTMORTEM INSPECTION

a) **Provision for Postmortem Inspection.**—The Chief of Bureau may require that meat or product be derived from carcasses that have received and passed a postmortem inspection made at the time of slaughter. No meat or product shall be prepared or distributed in the channels of trade without having received such postmortem inspection as the Chief of Bureau may require under this section.

b) **Facilities and Assistance.**—The owner or operator of each licensed plant where slaughtering is conducted shall furnish such facilities as may be required by the Chief of Bureau to permit the efficient conduct of postmortem inspection and to maintain the identity of all carcasses with their respective parts until the inspection has been completed.

c) **Disposition of Carcasses.**—Veterinary inspectors shall dispose of carcasses on postmortem inspection in conformity with such provisions of the appropriate Federal inspection

[2]An informative booklet concerning proper construction of a meat packing plant with illustrations of slaughtering facilities has been compiled by the Federal Meat Inspection Service and may be obtained from that agency in the U. S. Department of Agriculture, Washington 25, D. C., or from the Executive Secretary, AVMA, 600 S. Michigan Avenue, Chicago 5, Illinois.

regulations as may be adopted by the Chief of Bureau from time to time in his regulations under this Act, whether the carcasses are passed for food or condemned.

SECTION 7—TIME OF OPERATION

a) **Time of Operation.**—The Chief of Bureau may require operations at licensed plants to be conducted during reasonable hours. The owner or operator of each licensed plant shall keep the Chief of Bureau informed in advance of intended hours of operations. When one inspector is detailed to make inspections at two or more plants where few animals are slaughtered or where but a small quantity of food is prepared, the Chief of Bureau may designate the hours of the day and the days of the week during which such plants may be operated.

SECTION 8—PREPARATION AND HANDLING

a) **Food Subject to Inspection.**—All food in the channels of trade, whether fresh, frozen, cured, or otherwise prepared, even though previously inspected and passed, shall be subject to reinspection by Bureau inspectors as often as may be necessary in order to ascertain whether such food is sound, healthful, wholesome, and fit for human food. If upon reinspection any food is found to have become unsound, unhealthful, unwholesome, or in any way unfit for human food, it shall be condemned: Provided, That: When a food is found to be affected by any unsound or unwholesome condition that can be satisfactorily removed by methods approved by the Chief of Bureau, such food may be so reconditioned under the direction of a Bureau inspector. If upon final inspection the food is found to be sound and wholesome, it shall be passed for human food; otherwise it shall be condemned.

b) **Processing Operations to be Conducted Under Inspection.**—The owner or operator of each licensed plant shall inform the Chief of Bureau in advance regarding any food processing operations such as canning, cooking, curing, smoking, salting, rendering, freezing, etc., at his plant, and shall conduct such operations only at such times and in such manner as the Chief of Bureau may prescribe to assure clean handling of food and to afford opportunity for inspection.

c) **Chemical Preservatives, Etc.**—No food shall contain any dye, chemical, preservative, or other substance which impairs its wholesomeness or which is not approved by the Chief of Bureau.

d) **Trichinae.**—Inasmuch as it can not certainly be determined, by any present known method of inspection, whether the muscle tissue of pork contains trichinae, and inasmuch as live trichinae are dangerous to health, no article of a kind prepared customarily to be eaten without cooking shall contain any muscle tissue of pork unless the pork has been subjected to a temperature sufficient to destroy all live trichinae, or other treatment prescribed by the Chief of Bureau.

SECTION 9—INSPECTION LEGEND[2]

a) **Inspection Legend Prescribed.**—An inspection legend embodying the license number shall be applied by an employee of the licensed plant, under the supervision of an inspector, to such meat and product processed in such plant as the Chief of Bureau may require to be so marked. The inspection legend shall be in such form and design as the Chief of Bureau may prescribe to indicate that the food has been inspected and passed in accordance with this Act. At the discretion of the Chief of Bureau, the inspection legend and license number may be used on other foods processed at licensed plants.

SECTION 10—LABELING

a) **False or Deceptive Names.**—No label or mark on any food shall convey any false impression of identity, quality, or origin, and no container or covering of a food shall be so made, formed, or filled as to be deceptive or misleading.

b) **Labels.**—The Chief of Bureau may require food to bear such labels or marks as may be necessary to prevent deception. The label of a food shall include, prominently and informatively displayed: (1) The common or usual name of the product; (2) a list of the ingredients used in preparing the food if it is fabricated from two or more ingredients; (3) the name and place of business of the manufacturer, packer, or distributor; and, (4) an accurate statement of the quantity of contents.

c) **Composition of Food.**—The Chief of Bureau may prescribe such rules and regulations as may be necessary to control effectively the composition and processing of food for the purpose of preventing deception.

SECTION 11—ACCESS TO PREMISES

a) **Access to Premises.**—Inspectors shall be entitled to access at any time upon proper identification at all regular entrances and to all parts of premises for the purpose of making inspections under this Act.

SECTION 12—EMBARGO AND SEIZURE—DISPOSAL OF SEIZED FOOD

a) **Embargo and Seizure.**—The Chief of Bureau is authorized to prohibit the importation into the channels of sale of this jurisdiction of food that is unsound, unwholesome, improperly labeled, or otherwise not in accordance

[2]The brand to be used in applying the mark of inspection should be of a shape different than the round brand used by the federal meat inspection service, in order to render less difficult the distinction between the inspection marks of the two services.

with this Act. Any food found in the channels of sale within this jurisdiction by a Bureau inspector to be not in accordance with this Act shall be subject to seizure and confiscation by a Bureau inspector.

b) **Disposal of Seized Food.**—Seized food shall be condemned by a Bureau inspector unless it is of such character that it can be made to conform with this Act by methods approved by the Chief of Bureau. Condemned food shall be effectively destroyed for food purposes by the owner or handler of the food under the supervision of an inspector in such manner as the Chief of Bureau may prescribe.

SECTION 13—APPEALS

a) **Appeals from Inspector's Actions.**—Any appeal from a decision of an inspector shall be made to his immediate superior having jurisdiction over the subject matter of the appeal.

SECTION 14—RULES AND REGULATIONS

a) **Authority to Make Regulations.**—The Chief of Bureau shall make such rules and regulations as may be necessary for the efficient execution of the provisions of this Act.

SECTION 15—FINANCING

a) **Appropriation.**—There is authorized to be appropriated annually the sum of $———— to carry out the purpose of this Act.

b) **Fees.**—The Chief of Bureau is authorized to establish reasonable fees to be collected from owners or operators of licensed plants, only in such amounts as may be necessary to defray the cost, if any, required in excess of the sum provided by the annual appropriation to carry out the purposes of this Act. Such fees shall be equitably prorated and shall be paid to the treasurer of the { State / County / City } who shall credit the same solely to the above appropriation.

SECTION 16—REPORTS

a) **Inspection Reports.**—Reports of the work of inspection in licensed plants and elsewhere shall be made by inspectors on such forms and in such manner as the Chief of Bureau may specify.

b) **Information to be Furnished by Owners and Operators.**—The owner or operator of each licensed plant shall furnish to Bureau inspectors accurate information as to all matters needed by them for making their reports.

SECTION 17—COOPERATION WITH OTHER AGENCIES

a) **Coöperation with Other Agencies.**—The Chief of Bureau is authorized and directed to maintain a close working relationship with other public health and disease-control agencies to arrange a full exchange of information and correlate their respective activities.

SECTION 18—INSPECTION—PENALTIES

a) **Scope of This Act:** This Act shall have effect throughout the { State / County / City } of ————.

b) **All Food Subject to Inspection.**—No food shall be handled or transported in the channels of trade within the purview of this Act without such inspection as the Chief of Bureau may prescribe under this Act, except that a comparable inspection by an appropriate agency of the Federal Government or other agencies may be accepted by the Chief of Bureau.

c) **Penalties.**—Any person violating any of the provisions of this Act, or the rules, regulations, or orders properly issued thereunder, upon conviction, shall be deemed guilty of a misdemeanor and punished by a fine not to exceed $————, or imprisonment for a period of not more than ————, or both such fine and imprisonment at the discretion of the court.

SECTION 19—SAVING CLAUSE

a) **Saving Clause.**—If any section, paragraph, or sentence of this Act, or its application to any person, or in particular circumstances, is for any reason held to be invalid, such decision shall not affect the validity of remaining portions of this Act or its application to other persons or in other circumstances.

SECTION 20—INCONSISTENT ACTS

a) **Inconsistent Acts.**—Insofar as they conflict with the provisions of this Act, previous acts of this jurisdiction are superseded.

SECTION 21—EFFECTIVE DATE

a) **Effective Date.**—This Act shall take effect and be in force from and after ————.

"Convention Number" Next Month

The July JOURNAL *will feature the full program of the Boston convention, including speakers and subjects for general sessions and sections, entertainment plans, Women's Auxiliary activities, educational and commercial exhibits, and meetings of related organizations.*

Be sure to use the hotel reservation blank which is being provided in the JOURNAL *each month (advertising page xxviii of this issue). Reservations should be made not later than August 1.*

The Chemotherapy of Cecal Coccidiosis (Eimeria tenella) of Chickens

IV. Experiments on the Use of Chemotherapy During the Immunizing Exposure of Chicks

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THE CONTROL of cecal coccidiosis of chicks has been the subject of study by many workers. Chemotherapy involving the use of sulfonamides is a recent phase of the work, and was initiated by Levine[11-13], who showed that sulfanilamide and sulfapyridine were coccidiostatic when used against the less pathogenic species of Eimeria, and later demonstrated that sulfaguanidine was of distinct value as a prophylactic against *Eimeria tenella*. None of these drugs was shown to have a curative effect upon infections which have become established to the point when definite hemorrhage occurs, or during the fourth day after exposure. Thus, it was apparent that the merozoites were not inhibited, and harmful repetition of schizogony continued. However, Horton-Smith and Taylor[6] showed that sulphamezathine (= sulfamethazine, U. S. product) and sulfadiazine inhibited *E. tenella* after the establishment of the infection. Swales[15] confirmed the findings of Horton-Smith and Taylor, and showed that sulphamezathine was effective when treatment was commenced after hemorrhage was apparent. Swales also showed that a related drug, sulfamerazine, and also its soluble sodium salt, were highly coccidiostatic in infections due to *E. tenella;* he suggested that the pyrimidine structure, common to sulphamezathine, sulfadiazine, and sulfamerazine, was responsible for the inhibition of the merozoites. Hawkins[4] and Ripsom and Herrick[14] confirmed the findings of Horton-Smith and Taylor in respect to sulfamethazine and sulfadiazine respectively. The latter workers showed that sulfadiazine as 1 per cent of the feed given during the fifth and sixth days of infection prevented oöcyst formation but did not influence the development of immunity. Horton-Smith and Taylor[8] showed that chicks which recovered from acute coccidiosis as a result of treatment with sulphamezathine (sulfamethazine) were immune to the disease when exposed one week after treatment was discontinued.

Farr and Allen[3], and Allen and Farr[1] showed that sulfaguanidine had a marked prophylactic value when given as 1 per cent or 2 per cent of the mash for three days before and nine days after infection but had no curative value when given after the appearance of bloody droppings. Birds protected by sulfaguanidine medication remained susceptible to coccidiosis. These workers later showed that birds given only 0.5 per cent of sulfaguanidine in the mash for three days before and fourteen days after exposure were affected by coccidiosis to the extent that 5.6 per cent died but all the survivors were immune thirty-eight days later.

Following a series of experiments on the chemotherapy of *E. tenella* infections which extended over two years (Swales,[15-16]) detailed studies have been made on the rôle that chemotherapy can play in the actual control of the disease in Canada. Outbreaks of acute coccidiosis are somewhat unpredictable under the conditions of modern poultry husbandry, particularly in the large broiler plants where production is continuous. The disease is generally prevalent in early summer when chicks at the susceptible age of 3 to 6 weeks are removed from battery brooders and placed on floors or soil runs. However, no special preparations are made to combat an outbreak of coccidiosis until the disease has occurred. After the first few days of an outbreak death losses usually stop, even though the birds have received no treatment, and no further losses are suffered until a new lot of chicks is brought down

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from the brooders. In attempting to use one of the efficient coccidiostatic agents (sulfamerazine) under field conditions in 1945, it became apparent that owners seldom noticed the hemorrhage until the disease was well advanced, probably as late as five days after infection. Even if supplies of a suitable sulfonamide were immediately available, the chances of saving all the badly affected birds would, in many cases, be poor. Thus the need for a definite system of treatment, in addition to established methods of prevention and care during convalescence, was evident.

The key to practical control of coccidiosis is obviously the establishment of immunity in young chicks. However, it is not safe or practical to change the modern system of sanitary mass production of chicks in order to expose the very young birds to areas contaminated with oöcysts, although such exposure does occur when chicks are brooded naturally. Thus, means of exposing older and more susceptible chicks to infection, when there is a definite danger of an outbreak of coccidiosis, in such a way that severe disease will not occur, must be developed. Towards this end, Jankiewicz and Scofield[9] attempted immunization by administering oöcysts attenuated by heat. Waxler [17], and Waxler and Herrick[18] used x-ray attenuated oöcysts, and Herrick, Holmes, and Deguisti[5] did preliminary work on feeding tetraethylthiuram monosulfide as a controlling agent at the time of exposing chicks. This idea was extended by the work of Allen and Farr[1] and by the more recent observation of Horton-Smith and Taylor[8], both mentioned above.

It had been observed in our laboratories that no bird out of the hundreds infected and treated developed acute coccidiosis a second time, even though they were continually exposed to the infection up to the time of marketing. The measurement of the blood hemoglobin levels of birds treated with sulfamerazine had shown an average drop of about 2.7 Gm. per cent and therefore the birds had suffered a moderate infection which had been checked by drug inhibition (Swales[16]), but which had obviously produced strong resistance to reinfection.

EXPERIMENTAL OBSERVATIONS

The first experiment was designed to measure the degree of acute coccidiosis that chicks would develop if treated before and after artificial exposure to large numbers of oöcysts. Thirty Barred Plymouth Rock chicks, 6 1/2 weeks of age, were divided into lots of 10 in a battery, and all were bled for hemoglobin determinations. One lot was given mash containing 2 Gm. of sulfamerazine per pound for one day; then all the birds in each lot were dosed with 200,000 oöcysts of *E. tenella*. The treatment of the first lot was continued for eight more days after infection. The second lot was treated with the same drug and dosage level when they started to bleed eighty hours after infection, and treatment was continued for five days. The third lot was not treated. On the fifth day of infection the first (pretreated) lot was only slightly affected and there were no definite signs of hemorrhage in the pen. In the other two lots, hemorrhage was copious, although no deaths occurred even in the untreated controls. It is probable that these birds, purchased at 6 weeks of age, had previously acquired a moderate degree of resistance. Measurements of the blood hemoglobin levels were made for all birds on the sixth, tenth, fifteenth and twentieth days after infection. The results (fig. 1) revealed that hemorrhage, while being definitely less than in the other two lots, had occurred to some extent in the lot treated before and after infection. Thus, it was apparent that sulfamerazine in the level used for actual treatment of established coccidiosis did not prevent the development of a moderate infection which, in all probability, would be sufficient to cause the establishment of immunity.

A test of lower doses of sulfamerazine was then made, preliminary to more detailed experiments. Three groups of 10 Barred Plymouth Rock chicks, 5 weeks of age, were each dosed with 2,000 oöcysts and placed on floors previously contaminated by chicks which were recovering from infection with *E. tenella*. One group received 1 Gm. of sulfamerazine per pound of mash, another 0.5 Gm. per pound, both for three days, and the third group was not treated. By the ninth day, the death losses from acute coccidiosis were 60 per cent, 30 per cent, and 30 per cent, respectively, indicating that the lower dosage of the sulfonamide when given for only three days, did not confer adequate protection when exposure to infection was continued. The higher

death rate in the one treated group may have been due to factors of exposure or susceptibility but in any event does not represent a significant difference from the other groups in a small-scale experiment. The surviving birds in each lot were challenged with 250,000 oöcysts sixteen days after the beginning of the test and, as was to be expected of birds surviving such an infection, were found to be immune.

Experiments on the Correlation of Chemotherapy and Immunity.—In view of the preliminary observations above, more detailed experiments were set up. The first involved seven lots of 15 Leghorn chicks, 4 weeks old. Their normal blood hemoglobin level, recorded by the method of converting the hemoglobin to cyanmethemoglobin and reading in a photoelectric colorimeter, was found to be 9.97 ± 0.80 Gm. per 100 cubic centimeters of blood. They were weighed individually and wing-tagged; six of the lots of 15 were placed in pens on the floor of a warm building. The floors of these pens were covered with wood shavings that had been contaminated by chicks receiving from *E. tenella* infections and, in addition, each was sprinkled with approximately 1/2 million sporulated oöcysts. The seventh lot was placed in a similar pen in another part of the building away from sources of oöcysts; this latter group acted as control for hemoglobin levels, growth, and subsequent susceptibility to infection.

Treatment was started immediately in the contaminated pens, as follows:

Pen 1.—Chicks given mash containing 2 Gm. of sulfamerazine per pound of feed for three days.

Pen 2.—No medication.

Pen 3.—Mash containing 1 Gm. of sulfamerazine per pound for three days.

Pen 4.—Mash containing 1 Gm. of sulfamerazine per pound for six days.

Pen 5.—No medication.

Pen 6.—Mash containing 0.5 Gm. sulfamerazine per pound for six days.

Pen 7.—In clean room—no exposure to infection—no medication.

On the fifth day after exposure 6 birds in pen 2 and 3 birds in pen 5 died of acute coccidiosis. On the eighth day, 1 bird in pen 3 died. No further deaths occurred and it is obvious that the bird in pen 3 acquired the fatal infection about the time treatment was discontinued. Hemoglobin measurements on the sixth day showed average levels for the 7 pens, in the above order, of 9.8 ± 1.0,* 6.1 ± 2.1, 8.1 ± 1.8, 10.2 ± 0.9, 6.8 ± 1.8, 7.2 ± 1.8, and 11.3 ± 0.8. These data indicated that the birds receiving the drug in the 1- and 2-Gm. per pound levels had been very well protected up to that time. The birds remained in the experimental pens for thirteen days, at which time the weights and hemoglobin measurements were again recorded and the first six groups were placed together in a large cleaned pen. The average levels at this date, 8.7 ± 0.8, 9.1 ± 1.3, 9.2 ± 1.0, 8.8 ± 0.5, 8.2 ± 0.8, 7.9 ± 0.9, and 8.9 ± 1.0 Gm. per cent, suggested that the birds in pens 1 and 4 had been affected by coccidiosis to some extent, although the unexpected drop in the birds in the clean room made an interpretation unsatisfactory.

*The plus or minus figure in this paper represents the standard deviation.

TABLE I—Data on Deaths, Hemoglobin Levels, and Gains in Weight of 189 Chicks in Two Experiments

Exper.	Pen	Protective treatment (drug/lb. feed)	No. deaths—coccidiosis (on days from start) 5th	6th	7th	8th	Later	% Deaths	Avg. change in hemoglobin from level at start (Gm. %) Day 6th	Day 13th	Day 20th	Avg. gain in weight (27 days) (lbs.)
1	1	2 Gm. SM—3 days	0	0	0	0	0	0	—0.2	—1.3	—1.0	0.75
1	2	None	6	0	0	0	0	40.0	—3.9	—0.8	—1.3	0.76
1	3	1 Gm. SM—3 days	0	0	0	1	0	6.6	—1.8	—0.8	—1.3	0.71
1	4	1 Gm. SM—6 days	0	0	0	0	0	0	+0.2	—1.2	—1.3	0.68
1	5	None	3	0	0	0	0	20.0	—3.1	—1.7	—1.7	0.68
1	6	0.5 Gm. SM—6 days	0	0	0	0	0	0	—2.8	—2.0	—1.1	0.75
1	7	Not exposed	—	—	—	—	—	—	+1.3	—1.0	—0.6	0.89
2	1	2 Gm. SM—3 days	0	0	0	0	0	0	—0.3	—0.3	—0.9	0.49
2	2	None	0	3	1	0	0	33.3	—2.4	—1.0	+0.6	0.55
2	3	1 Gm. SM—3 days	0	2	0	0	0	16.5	—1.6	—0.1	0	0.64
2	4	1 Gm. SM—6 days	0	0	0	0	0	0	—0.3	—0.6	—0.4	0.72
2	5	None	4	2	1	0	0	58.3	—1.9	—1.0	0	0.75
2	6	0.5 Gm. SM—6 days	2	3	0	0	0	41.7	—2.2	—1.4	+0.4	0.58
2	7	Not exposed	—	—	—	—	—	—	+1.0	+0.7	+0.6	1.14

SM = Sulfamerazine.

That the drop in pen 7 was not due to coccidiosis was evident when these birds were found to be highly susceptible to the disease when challenged with 125,000 oöcysts. Six of the 15 birds were challenged and 3 of them died of acute coccidiosis on the sixth day following. The hemoglobin of the surviving 3 dropped from an average of 9.5 to 6.6 Gm. per cent (included in fig. 2). It is probable that the somewhat greater than normal gain in weight of the unexposed birds was at least partly responsible for the decreased hemoglobin level in pen 7. The birds in the first six pens were found to be immune when similarly challenged on the fifteenth day after the start of the experiment.

TABLE 2—Average Hemoglobin Levels of Chicks with Various Levels of Treatment with Sulfamerazine, in Three Experiments

Group of chicks	Average blood Hemoglobin levels (grams per 100 cc.) Before exposure	No. chicks	6 days' exposure	No. chicks	13 days' exposure	No. chicks	6 days after challenge dose	No. chicks
Not exposed, not treated....	9.4 ± 0.8	35	10.3 ± 1.1	35	9.4 ± 1.0	35	6.3 ± 1.6	11
Exposed, not treated.....	9.4 ± 0.8	74	5.8 ± 2.2	48	8.5 ± 1.0	46	8.9 ± 1.0	45
Treated, 2.0 Gm. SM/lb. feed—3 days	9.4 ± 0.8	37	9.3 ± 0.9	37	8.5 ± 0.8	36	8.6 ± 1.5	36
Treated, 1 Gm. SM/lb. feed—3 days	9.4 ± 0.8	27	7.8 ± 2.2	26	9.0 ± 0.9	24	8.9 ± 1.0	24
Treated, 1 Gm. SM/lb. feed—6 days	9.4 ± 0.8	37	8.2 ± 2.4	37	8.7 ± 0.8	37	8.6 ± 0.9	36
Treated, 0.5 Gm. SM/lb. feed—6 days	9.4 ± 0.8	27	7.0 ± 1.9	22	7.8 ± 0.7	22	9.0 ± 1.0	22

SM = Sulfamerazine.

Repeated Experiment.—The above experiment was repeated with 84 chicks from the same hatch as those used above, but which were, at this time, 6 weeks old. They were divided into seven lots of 12, and placed in the same pens which had not been cleaned, although fresh wood shavings were added to the litter.

The hemoglobin level of the 84 birds was 8.9 ± 0.9 Gm. per cent, and the average weight 1.1 lb. The treatments were exactly the same as in the previous experiment.

The death rate from acute coccidiosis was somewhat greater in this experiment (table 1); this was probably due to the increased contamination in the pens by the birds in the previous experiment. No deaths occurred in the groups protected by 2 Gm. of sulfamerazine per pound of feed for three days and by 1 Gm. per pound for six days. However, the 0.5 Gm. level for six days failed to give adequate protection. The change in the average hemoglobin levels did not show a significant difference between these two groups which were successfully protected in both experiments. In the first experiment, the birds in both of these pens remained in apparent good health throughout, but in the second experiment, those on the 2 Gm. per pound of feed level for three days appeared to be affected to some extent by the challenge dose of oöcysts; they bled to a small extent and their average gain in weight was not satisfactory during the next twelve days; this is reflected in the twenty-seven-day gain shown in table 1.

It will be noted that the gains in weight of the surviving birds in three of the four exposed but untreated groups were satisfactory, according to generally accepted standards for Leghorn chicks of this age, sexes about equal in numbers. Except for a few retained as breeding stock, all surviving birds were shipped to market at the age of 10 or 11 weeks and were classed as grade A broilers.

Experiment to Compare Medication in Feed and in Water.—An experiment was arranged to check the previous findings in regard to the protection afforded by 2 Gm. of sulfamerazine per pound of feed for three days and 1 Gm. per pound for six days, and also to compare these with a soluble preparation. The same seven pens were used after being cleaned, scalded, and then recontaminated for four days by chicks recovering from *E. tenella* infections. Ten chicks were used in each group; this time they were a mixed lot, 7 and 8 weeks old, Leghorns and Barred Plymouth Rocks. They were equally divided into seven lots in so far as size and breed were concerned. As before, the treatments were

started as soon as the birds were placed in the pens, as follows:

Pen 1.—2 Gm. of sulfamerazine per pound of mash for three days.

Pen 2.—2 Gm. of a mixture of sodium 2-sulfanilamido-4-methyl-pyrimidine 80 per cent, phthalysulfathiazole, 10 per cent, and sodium carbonate monohydrate 10 per cent, per liter of water, for three days.

Pen 3.—No treatment.

Pen 4.—No treatment.

Pen 5.—1 Gm. sulfamerazine per pound mash for six days.

Pen 6.—1 Gm. of the above soluble sulfonamide mixture (as pen 2) per liter of water, for six days.

Pen 7.—Not exposed and not treated.

One bird in pen 3 died of coccidiosis on the fifth day. On the sixth day, 4 in pen 3, 3 in pen 4, and 2 in pen 5, died. On the ninth day, 1 bird died in pen 1. No further deaths occurred from coccidiosis, although 1 bird from each of pens 1, 2, 4, and 5 died from nonparasitic enteritis between the ninth and twentieth days.

From the preëxposure level of 9.8 ± 0.9 Gm. per cent the hemoglobin levels fell in six days, in order of Pens 1-7, to 8.4 ± 0.5, 4.4 ± 1.4, 4.0 ± 1.3, 2.8 ± 0.3, 5.3 ± 0.7, 2.7 ± 0.8, and 8.8 ± 0.7. Seven days later the levels were 8.0 ± 0.7, 8.1 ± 0.7, 8.6 ± 0.6, 8.8 ± 0.6, 9.2 ± 1.0, 9.0 ± 0.5 and 9.8 ± 0.3 Gm. per cent.

On the fourteenth day, one day after the last hemoglobin estimations were made, the birds were all challenged with 125,000 oöcysts in a single dose administered by pipette into their crops.

Six days later the average hemoglobin levels were 8.6 ± 0.6, 8.4 ± 1.4, 9.3 ± 0.6, 9.0 ± 0.9, 8.6 ± 1.2, 9.3 ± 0.7 and 5.4 ± 2.0. In the case of pen 7, this figure is the average of the 5 survivors; there were five deaths as a result of the challenge. Except for 1 bird in pen 2 and 1 in pen 5, whose hemoglobin levels dropped from 7.2 and 9.4 to 5.9 and 6.4 respectively, the first six lots remained unaffected by the challenge, and hence had acquired a strong immunity.

It was apparent from this experiment that the soluble sulfonamide preparation had not been as efficient as the insoluble drug in the feed. However, the insoluble form in the 2 Gm. per pound of feed level provides 2 Gm. of 2-sulfanilamido-4-methylpyrimidine, while 2 Gm. of the soluble mixture at 2 Gm. per liter provides only 1.44 Gm. of 2-sulfanilamido-4-methylpyrimidine, because 28 per cent of the mixture is accounted for by the sodium and the other ingredients. This has been pointed out by Swales,[13] who showed that an increase from 2.0 to 2.5 Gm. of this preparation per pound of feed or per liter of water provided a therapeutic effect equal to that of 2 Gm. of sulfamerazine per pound of feed. Hence this experiment, which was conducted immediately before the adjustment was made, was carried out on a basis unfavorable to the soluble mixture. If 2.5 Gm. per liter of water for three days had been used in pen 2 and 1.25 Gm. per liter for six days in pen 6, it seems certain, in view of the adjustment, that the birds concerned would have been accorded protection equal to those that received the insoluble drug in the feed (pens 1 and 5). As it was found in previous work in this laboratory that drug consumption by chicks

TABLE 3—Observations on Weights of Birds Used in Two Experiments

Groups of chicks	Exper. No.	Weights of birds (lbs.), ± Standard Deviations				
		At start	In 2 weeks	In 3 weeks	In 4 weeks	In 5 weeks
Not exposed, not treated.	1	0.57 ± 0.09	1.03 ± 0.10	1.23 ± 0.16	1.46 ± 0.28	1.78 ± 0.19
	2	1.01 ± 0.11	1.61 ± 0.20	1.90 ± 0.24	2.15 ± 0.21	2.32 ± 0.29
Exposed, not treated.....	1	0.58 ± 0.02	0.91 ± 0.12	1.08 ± 0.18	1.30 ± 0.22	1.44 ± 0.25
	2	1.04 ± 0.10	1.18 ± 0.17	1.40 ± 0.17	1.64 ± 0.26	1.88 ± 0.32
Treated, 2 Gm. SM per lb. feed—3 days	1	0.55 ± 0.21	0.94 ± 0.11	1.15 ± 0.12	1.30 ± 0.17	1.50 ± 0.19
	2	0.93 ± 0.13	1.18 ± 0.18	1.31 ± 0.21	1.42 ± 0.30	1.65 ± 0.33
Treated, 1 Gm. SM per lb. feed—3 days	1	0.55 ± 0.15	0.88 ± 0.10	1.02 ± 0.10	1.26 ± 0.16	1.41 ± 0.24
	2	1.02 ± 0.07	1.28 ± 0.05	1.46 ± 0.13	1.67 ± 0.16	1.90 ± 0.22
Treated, 1 Gm. SM per lb. feed—6 days	1	0.56 ± 0.05	0.91 ± 0.12	1.09 ± 0.10	1.24 ± 0.21	1.40 ± 0.29
	2	1.01 ± 0.08	1.33 ± 0.19	1.48 ± 0.23	1.73 ± 0.25	1.96 ± 0.32
Treated, 0.5 Gm. SM per lb. feed—6 days.....	1	0.56 ± 0.08	0.91 ± 0.16	1.14 ± 0.18	1.31 ± 0.21	1.54 ± 0.22
	2	1.02 ± 0.08	1.20 ± 0.21	1.37 ± 0.25	1.58 ± 0.25	1.80 ± 0.28

SM = Sulfamerazine.

is approximately the same if a certain amount is either mixed in 1 lb. of feed or dissolved in 1 liter of water, this test has served to show that the difference between 2.0 Gm. and 1.44 Gm. of the active principle is very great in so far as power of protecting the birds at the time of infection is concerned. The minimum amount for satisfactory results is probably in between these two levels.

FIG. I.

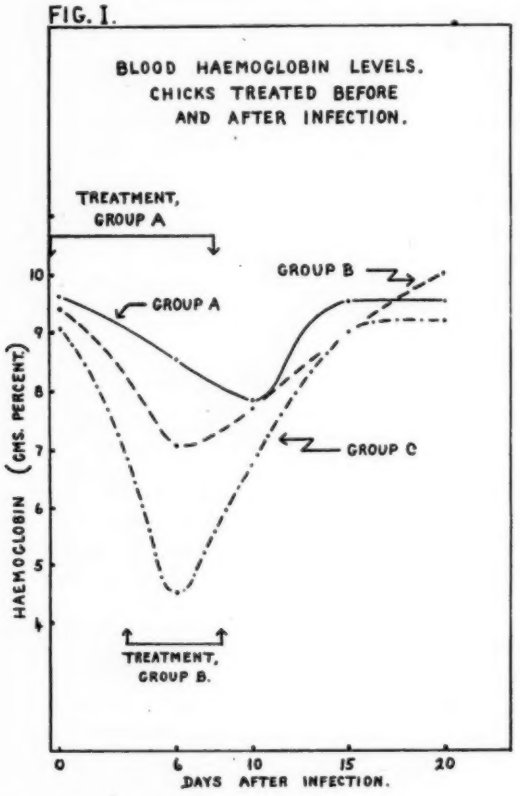


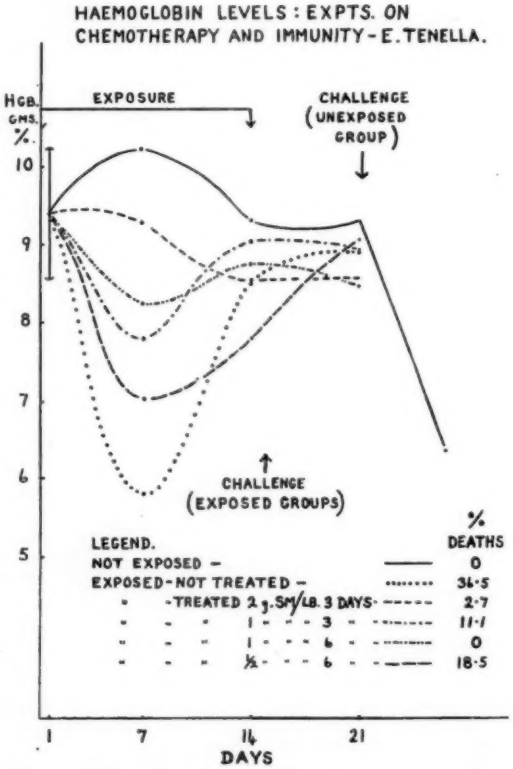
Fig. I—Group A: 10 chicks, treated for one day before, and eight days after, inoculation with 200,000 oöcysts of Eimeria tenella, with 2 Gm. of sulfamerazine per pound of feed.
Group B: 10 chicks, similarly infected, but treated (2 Gm. SM/lb. feed) only when hemorrhage commenced (at 80 hours) and for five days.
Group C: Infected as above but not treated.

Taking the use of the insoluble drug as a standard procedure for the experiments herein described, the records of the blood hemoglobin determinations of the birds so treated in the three experiments as well as those of all untreated birds, are shown graphically in figure 2.

The six average hemoglobin levels at the seventh day (after six days of exposure) are those of 35 unexposed chicks, 48 surviving chicks which were exposed but not treated, 37 treated with 2 Gm. sulfamerazine per pound of feed for three days, 26 survivors treated with 1 Gm. of the drug per pound for three days, 37 treated with 1 Gm. per pound for six days, and 22 survivors of those treated with 0.5 Gm. for six days. The hemoglobin levels in grams per 100 cc. blood, together with the standard deviations, are shown in table 2.

Observations on Weights of Experimental Chicks.—The weights of the chicks were recorded at the start of each experiment and at weekly intervals until they were shipped as broilers. The weights of the birds used in the first two experiments employing the seven floor pens are shown in table 3. These chicks were all Leghorns hatched at the same time. In the experiment designated as no. 1, there were 15 birds in each lot, except in the "exposed, not treated" group, in which there were 30; they were 4 weeks old at the start. In experiment 2, there were 12 in each lot, except "exposed, not treated," in which there were 24. In this experiment, the birds

FIG. II.



were 6 weeks old at the start. This difference in age made it necessary to show the average weights separately. In the groups in which deaths occurred (see table 1), the number of birds included in the average weights after the start was correspondingly reduced from the above numbers.

It will be noted that there is no indication that the drug caused differences in weights through toxic effects. However, it is apparent that the birds not exposed to coccidiosis gained weight at a significantly greater rate than those that were exposed in these experiments.

DISCUSSION

The data obtained from this study show that sulfamerazine, (2-sulfanilamido-4-methylpyrimidine) in low levels in the feed, protects birds from fatal cecal coccidiosis when they are exposed to heavily contaminated surroundings, but allows them to acquire a moderate infection which quite rapidly produces a strong immunity. In this regard, it is apparent that 1 Gm. of the drug mixed in each pound of dry chick mash and given to the chicks for six days, beginning at the time they are exposed, was the most efficient method in our experiments. The higher dosage level of 2 Gm. per pound afforded greater protection from the primary exposure but from the data on blood hemoglobin levels it appears that the birds remained partly susceptible to the infection and suffered to some extent from the continued exposure subsequent to the period of medication. The period of three days on the 1 Gm. per pound of feed level was inefficient, as was the 0.5 Gm. level for six days; in the former case, the partial inhibition of the parasite was not continued for a sufficiently long period, and, in the latter, there was an inadequate inhibitory effect.

As the ultimate objective of this work is to add facts to those already known regarding cecal coccidiosis so that an improved system can be recommended for the control of the disease, it is necessary to examine the data from the viewpoint of economy and safety. Sulfonamides should obviously be used only when necessary and in doses as small as possible consistent with an optimum therapeutic or prophylactic effect. The relatively small amounts of sulfamerazine used in this work are apparently practical from the viewpoints of economy and safety. It is entirely probable that the other pyrimidine-sulfonamides, sulfamezathine and sulfadiazine, can be similarly used, in view of previous data. In developing an improved system for practical control, it would seem unwise to recommend that all chicks be treated prophylactically as a routine measure, as lack of concurrent exposure to infection would render the measure quite useless. Thus, it is apparent that the method of actual treatment of birds with established infections should be adopted when the symptoms of cecal coccidiosis are first seen.[4, 6, 12, 13] This measure, if adopted promptly, should prevent any serious loss of chicks. Following such an occurrence of disease it will be known that the younger chicks on the plant, which have been similarly managed, will likewise be susceptible to harmful cecal coccidiosis and it will be known also that the floors, to which chicks from the brooders are to be moved, are contaminated. In such a situation, it appears that exposure to such floors of further groups of chicks should be controlled by prophylactic medication, possibly as demonstrated in these experiments. However, the purposeful exposure of birds to infection, if immunity is to be properly established, will result in some degree of anemia, the effect of which must be considered. It appears from our data (table 3) that all exposed birds have a somewhat slower growth. However, from published records of normal weights (*Canadian Poultry Handbook*, Dominion Department of Agriculture, 1940) the birds in experiments 1 and 2 (table 2) should weigh approximately 1.4 and 1.8 lb. respectively at five weeks after the start of the experiment (9 and 11 weeks of age). Thus the birds protected by treatment and the survivors of the unprotected and the inadequately protected groups, do not actually show abnormally slow growth. The unexposed groups, which remained highly susceptible to infection, were kept in a brooder room at 80F. and this high temperature might have been responsible for their greater than normal gains in weight. It is, therefore, suggested that the fact that the birds in the other groups were immunized is of greater economic importance than the higher body weights of the unexposed, susceptible chicks.

This work also raises the point in regard to the period of exposure necessary to establish immunity. The first six days of

exposure, if kept under control by a low level of medication, apparently brings about a degree of resistance which protects the chicks from the continued exposure in the contaminated pen. Farr[2] has shown that a single heavy inoculation of oöcysts of *E. tenella* did not produce effective resistance to coccidiosis, but 15,000 oöcysts given over a period of 15 days produced a high and lasting degree of resistance. It is possible that an overwhelming dose of oöcysts would overcome the resistance which the birds in our experiments developed during the first six days, but the continued exposure resulted in a strong immunity as shown by the lack of effect of the challenge inoculation after 14 days. Preliminary studies have indicated that the birds protected from fatal coccidiosis for six days are strongly resistant on the seventh day; these and related tests are being continued. However, as it is very unlikely that a single overwhelming dose could be acquired under natural conditions in one day, it is entirely probable that the method can be adopted for farm use at the present time.

SUMMARY

The protective effect of small amounts of sulfamerazine in the feed of chicks at the time they are exposed to oöcysts of *Eimeria tenella* has been tested experimentally.

One Gm. of the drug per pound of dry mash, given for the first six days of exposure, resulted in complete protection of the chicks against fatal cecal coccidiosis, yet allowed them to develop a strong degree of resistance; when challenged in 14 days, the chicks were found to be immune. Other doses and periods of medication were tried and found to be less efficient.

It is suggested that other sulfonamides which include the pyrimidine-ring structure will be likewise protective. There is an obvious advantage in using such a sulfonamide, which has an actual curative effect, when protection of chicks during immunizing exposure is adopted.

In these experiments, the blood hemoglobin levels of the chicks were used as measurements of the degree of resistance to cecal coccidiosis.

The records of the weights of the birds did not reveal any serious effect from the "chemically protected" exposure to coccidiosis.

The practical application of this work might involve a system whereby infected chicks should be treated immediately by the sulfonamide method as previously demonstrated and that succeeding groups of chicks on the contaminated premises should be accorded the protective treatment while they are acquiring immunity from exposure to contaminated floors.

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Proposed Amendments to Constitution and Administrative By-Laws

PROPOSAL No. 1

[The purpose of this proposal is to permit the outgoing president to serve as an *ex officio* member of the Executive Board for one additional year, replacing the present member-at-large, and thus retaining the present number of Board members (13). If this purpose is to be effected, the following several changes in the By-Laws must be made.]

Amend Section 3 of Article II of the By-Laws by adding the following paragraph:

"f) At the conclusion of his term of office, the president shall serve for one year as a member *ex officio* of the Executive Board."

Amend Section 1 of Article VIII of the By-Laws by striking out the words "a member-at-large" and substituting therefor the words "the immediate past president."

Amend paragraph (a) of Section 2 of Article VIII of the By-Laws by striking out the words "and the member-at-large" from the first sentence, and by deleting the entire second sentence of this paragraph.

Amend paragraph (c) of Section 2 of Article VIII by adding the following sentence: "The immediate past president shall serve as a member of the Executive Board for one year only."

Amend paragraph (a) of Section 3 of Article VIII by striking out the words "except in the case of the member-at-large, which shall be filled by election at the next general assembly," and by changing the comma after the word "time" to a period.

PROPOSAL No. 2

[The purpose of this proposal is to permit the incorporation of Mexico, the West Indies, and the Panama Canal Zone into Zone 3 of the official apportionment map of areas for AVMA conventions.]

Amend paragraph (b) of Section 1 of Article XI of the By-Laws so that the first sentence will read "Place: The United States, the Dominion of Canada, the Republic of Mexico, the West Indies, and the Panama Canal Zone shall be divided into four convention zones for the holding of annual sessions in such numerical order as to favor alike all sections within the contiguous territory of these countries."

PROPOSAL No. 3

[The purpose of this proposal is to integrate membership in constituent associations (state, provincial, territorial, and other veterinary associations affiliated with the AVMA) with AVMA membership. If this purpose is to be effected, the following several changes in the Constitution and Administrative By-Laws are necessary.]

1) Amend Article III, Section (b) of the Constitution to read:

"*General Membership.*—The general membership, otherwise known as the active membership, shall consist of (1) graduates of veterinary colleges approved by the Association who are members of their respective constituent associations and who have been duly elected in the manner hereinafter provided, and (2) associate members who have been duly elected as provided in paragraph (c) of this article.

"c. *Associate Membership.*—The associate membership shall consist of veterinarians duly elected in the manner provided by the by-laws who live in countries outside of the United States and the Dominion of Canada, and who are otherwise eligible but do not or could not hold membership in a constituent association."

Present paragraph *c)* would become *d)*, and present paragraph *d)* would become *e)*.

2) Amend Article IV, Section 1 of the Constitution to read:

"State, territorial, and provincial veterinary associations of North America, The National Association of Federal Veterinarians and the official association of veterinarians of the United States Army which have or may hereafter become organized in conformity with the general plan of the American Veterinary Medical Association, and which have adopted the same qualifications for membership, shall be recognized upon application as constituent associations provided such application is approved by a majority vote of the Executive Board."

3) Amend Article X, Section 2 a) of the By-Laws as follows:

Drop the last sentence and replace with: "The application shall contain the certificate of the secretary of the constituent association that the applicant is a member in good standing of that body."

"The American Veterinary Medical Association reserves the right to reject the application of any member of any constituent association."

4) Add a new paragraph (b) to Section 3, Article X as follows:

"Members who have been dropped from constituent associations shall be dropped from the American Veterinary Medical Association on official notification by the secretary of the constituent association and shall be reinstated in the same manner. Whenever a member of this Association is dropped for any reason, the secretary of the constituent association in which he holds membership shall be notified promptly."

5) Replace Section 4 of Article X with the following:

Section 4. The applications of candidates for associate membership shall be submitted to the Executive Board and shall be accepted or rejected by that body at any regular or special meeting. Associate members shall have all of the rights and privileges and be subjected to the same obligations as other active members except only that they are not required to maintain membership in a constituent association.

Present Section *4* would then become Section *5*, and present Section *5* would become Section *6*.

6) Amend present Section 5 by making subparagraph (a) a part of proposed new Section 4, and changing last part of this paragraph to read:

"provided they have applied for membership in a constituent association within three months after graduation."

Historical Sketches and Memoirs

I. Foreword and Introduction

L. A. MERILLAT
Chicago, Illinois

This is the first in a series of "Historical Sketches and Memoirs" by Dr. Merillat which will appear in the JOURNAL *during coming months. For nearly sixty years—a period embracing the major developments in American veterinary medicine—Dr. Merillat has viewed the passing scene of veterinary affairs from many angles: as an educator, as a clinician and surgeon, as an organizer and executive of veterinary associations, as an officer in the Veterinary Corps of World War I, and as an author and editor, to mention only a few. Of no one else, perhaps, in the profession today, in relation to the subject matter of which Dr. Merillat writes, can it be so truly said, "Most of this he saw, and part of it he was."*

Some will not agree with the views expressed in these sketches; others may differ in their interpretation of incidents. But no veterinarian who reads them can fail to be stimulated and aroused to a greater interest in his profession's background and accomplishments.—J. G. H.

IN THESE days of almost fanatical determination to remake the world in nearly all principal connections, there is so much concern about problems of the present that the lessons of former days are omitted from all consideration, as if history may not repeat itself unseen before our very eyes in the future as always before.

I.

Character of the Material

This piece is going to be a series of sketches, memoirs, and biographical notes on veterinary medicine in the United States, beginning with the dawn of our profession. The mental pabulum (if any) is neither history nor biography in sequential arrangement—a chronicle, not chronological. *Autobiography* doesn't apply. *Criticism* might be better, but *heterobiography* is more nearly right. In certain poignant respects, some of the material might not be sanctioned under any title. It is the expression of one mind—one point of view. No more is claimed, no more is intended. If seemingly a pedagogic splurge, there is no desire, whatsoever, to press thoughts upon unwilling takers, but in respect for truth, conventional propriety may have to be disobeyed despite the high DP (dynamite potential) of the American veterinarian as seen at close range for quite a spell. Veterinarians I have met in this country and from other parts of the world are allergic to the therapeutics of their functional ailments, pretty much the same as the industry they serve is allergic to the treatment of its faulty operations, *vide*, the American veterinarian's long-lasting, unreceptive mood toward working in close formation, on one hand, and, on the other, the never-ending neglect, disregard, and open opposition of the livestock industry to classical veterinary service.

Among the intramural discords were the drawn-out, demoralizing disputes among the colleges from the 1850's to the 1920's, and the endless bickerings between the graduates and nongraduates starting from the no-college, no-profession period. All of this pandemonium I have seen change in form but not in relative magnitude. Among the livestock folk, there were the rabid barkings and bitings and lawsuits over stamping out bovine contagious pleuropneumonia, the vicious bombing of tickicide vats in the South, the pitchfork brigades mobilized to thwart the eradication of bovine tuberculosis, and the continuous determination of the agrarian interests to scatter virulent viruses to the four winds, come what may to national security. In fact, as long as I can remember, both the veterinarian and his client have taken the public-be-damned attitude wherever and whenever the advance of veterinary medicine touched the

pocketbook. While, through absolute necessity, some improvement is seen, the veterinary-livestock Utopia remains in the offing. The trouble is deep-seated and complex, difficult to describe, and as incomprehensible at a glance as human nature. It stems from the long neglect on the part of the states to establish formal veterinary education and to map out a definite place for its graduates. It's hard to broach the subject inoffensively, without being a fraud.

On the part of the veterinarians, they worked for years without policy or plan, leaving the public to shape its own idea as to their purpose. Uncoached, naturally, the shaping was amorphous. Organization for planned action, backing education for the good of the cause, and supporting periodical literature for personal improvement and guidance were sluggish to a pitiful degree throughout many years. Some were supinely contented and did nothing, while the majority strove to growl themselves into thrifty contentment without lending a helpful hand to leaders who were working, cheerless, the hard and only way, to lift veterinary medicine from its lowly status because the fine points of the game were not generally understood. The clinical group, up to recent years at least, heckled over its plight, while the scientific group proudly celebrated its great achievement. The art weltered, the science blew its horn, neither making a dint in the public conscience nor going to higher defensive levels. Too frequently, the offensive cracked up from lack of understanding.

I have watched the veterinary service take a triple form: (1) a nonveterinary group of capable scientists *above*, (2) an army of incompetents and home doctors *below*, and (3) the bewildered graduate veterinarians in the *middle*—all three fighting undercover among themselves, and the integer a mess unable to serve the people in effective fashion. Of course, I am not making myself clear. It's too involved to comprehend in a jiffy. That's one reason this series of sketches was started. That's why they must cover a lot of territory. The hope is that a more workable insight into the history of veterinary medicine since the 1840's up to the moment may serve for planning the future. Unfortunately, unpleasant things have to be told about men, motives, and consequences. There is no intention, however, to scribble purposeless malice nor to scratch old sores for the fun of the thing. All that counts is the good of the cause on the long pull.

2.

The American Veterinarian

The individual American veterinarian is an independent soloist, hard to teach the benefits of association work—a quite helpless chap entangled within a tremendously big industry of many ramifications, without the will to "gang up" for the self-preservation of his calling. "He Is Few and His Work Is Legion." He has been expending his energy griping, growling, complaining,—the sure way to the Land of Failure. The individualist cuts corners and fails, the collectivist takes the hard way and wins. The association man has the guidance of master minds which the lone wolf does not have. Association work is preëminent because it is planned, shaped, guided, and motivated, deliberately. The fact that there has been too little of it has been a headache in the advance of veterinary medicine in the United States.

Lest I am misunderstood, this is not going to be a course of lectures to persuade anyone to join anything. The readers are college men past maturity, who will have to sleep in the bed they make. It's too late in my life to be raving over the advantages of organized veterinary medicine, its painful dystocia, its neglected boyhood, and slow adolescence, its obvious present, and its problematic future. A certain die has been cast. It's up to the American veterinarian to use, remodel, or discard it. These sketches are committed to the mercy of his conscience. Why waste moments and ink to tell college-bred men of this day that associations are "public administrative institutions," the soul and voice and strength of a learned profession, its Army and Navy and Air Force, the architect of the house in which it must live and labor, and the frontier of its wisdom? One doesn't go back to long division to bone up for a college degree.

3.

Quitters

The fault next to not belonging to associations at all is getting huffed up and resigning when one's ideas are disapproved. Staying in and fighting for personal opinions is better for all concerned than quitting and pouting over

disagreements. When a fighter stops fighting for a cause, the enemy wins. There are important examples of this sort to relate: (1) When Robert Jennings in the 1860's quit association work, the AVMA was stymied for thirty years. Education became a game rather than a project and was jockeyed for personal gain. (2) M. H. McKillip was also a "resigner." He withdrew completely from Illinois association work in 1885, too proud to permit his application for membership to be validated by a board of censors containing a nongraduate. That pout cost the Illinois and the national associations the influence of an important figure. (3) W. L. Williams resigned from and derided the United States Livestock Sanitary Association and the AVMA, never again to take part in these two national societies because committees did not agree with his views on abortion disease. (4) A. T. Peters, prominent in Midwest veterinary medicine, was lost to the profession for years on account of disagreements with a state university. These are so many examples of the virtue of staying in when things go berserk in association work. This gives the opportunity of naming W. Horace Hoskins as America's greatest veterinarian. He took the leadership of the belligerent minority, instead of going on a sit-down strike.

These "Sketches" are not addressed to any one group. There have been delinquents of one kind or another in every branch, as seen in the faculty meeting, the barnyard, the laboratory, the battlefield, and the cocktail lounge, and there has been skill, wisdom, error, blunder, egotism, and lots of fun to write home about. There hasn't been a dull day. Pity the man who doesn't cherish the work he has to do for a living, as Victor Hugo said.

4.

Who's the parvenu? Just a Chicago practitioner who happened to live through the long period of veterinary development.

The Background

Not a Ph.D.? Hell, No! Sons of farmers tilling the soil between the hardwood stumps of north central Ohio didn't go to Harvard and Yale in the 1880's. Only the aristocrats could do that. In October, 1872, age 4-1/2 years, I was enrolled as a scholar in a little white schoolhouse called Rockydale, two miles east of Mt. Eaton, Ohio (pop. 200). The precocious matriculation was a family convenience. When two brothers, Alfred, 6, and Edward, 10, along with two sisters, trekked over the hills to the schoolhouse with a big, homemade willow lunch basket filled with buttered bread, smoked pork sausage, hardboiled eggs, apples, and apple pies, it was not convenient to leave the mischievous youngster at home. The companionship of two brothers who were to become prominent in the local educational circle and who, later, played a rôle in the development of veterinary medicine in this country can neither be omitted nor forgotten in the writing of these sketches. Here, I am telling for the first time that Captain Alfred C. Merillat (U.S.M.A. '90), Troop H, 3rd Cavalry, was an incessant worker, within the Army, for commissioned rank for army veterinarians. He worked to that end with M(icheal) J. Treacy (M.R.C.V.S. '74) of the 8th Cavalry while on duty at western outposts, and with Dr. Rush Shippen Huidekoper in Washington, while serving with his regiment at Fort Myer across the Potomac (*vide*, Sketch II). The Captain is on record as a casualty of San Juan Hill and of Col. John J. Pershing's Philippine campaigns, where he was retired for disability at the early age of 38. M. J. Treacy, New York born, was one of the early Americans who went abroad for a veterinary education. He was a classmate, at Glasgow, of Joseph Hughes, later to be president of the Chicago Veterinary College. In his (Treacy's) occasional stop-overs in Chicago during the 1890's, he never failed to speak of Captain Merillat as the only commissioned officer who received him as a social equal. Their admiration was mutual, as Alfred spoke of Dr. Treacy as a charming companion and capable veterinarian. The status of army veterinarians being what it was at that time, this seems to belong in veterinary history. It was the character and ability of men like Treacy that finally justified the granting of commissioned rank to veterinarians of the military service, in 1916. Edward Merillat is mentioned because of his work in connection with the McKillip and Chicago colleges. Back to the story.

My schooling was precocious and was kept that way through my constant association with these two remarkable brothers. American historians agree that Ohio—home of many small colleges—doted on learning for its children. My favorite

studies were grammar and history. Grades were marked E, G, F, P, and O. I recall some E's and G's in grammar and history and abundant P's in mathematics. General education in small towns seemed to be off balance those days—tried to top the B.A. in high school within the three R's. I was tussling (in vain) with integral calculus when whisked off to the Ontario Veterinary College at the age of 18-1/2 years. While the boasting is good, I should add that Captain Merillat was the catcher of the first West Point baseball team and is credited with being one of the founders of athletics at "The Point." In retirement, he was the first secretary and one of the founders of the now sizable Veterans of Foreign Wars. So much for family biography. It's a part of the theme, as we shall see.

5.

Writing for Journals

Everyone likes to see his name in print. The delectation is a universal obsession and incurable. To hide the fact is deceitful. The literary hermit by choice is a mental case and a rare lummox. Whether one's name is connected with a literary masterpiece or just among those present at the church social, there comes a thrill that varies only in degree.

Coming upon the scene in the 1880's with the characteristic atavism of American pioneers, it was natural to acquire the habit of "writing for the journals," for, besides the sensation of seeing my name in print, helping out the troubled editors seemed to be a chance to get into the "uplifting business." The back numbers and current issues of the *American Veterinary Review* seemed like subtle defenses of low educational standards in the editorial columns, and the technical material was predominantly reprints or translations from foreign journals. The American contributions were short, elementary case reports by practitioners and the rest were a lot of sickening pseudoscientific controversies among the public functionaries. I am not poking fun at that. It was a case of *status quo* "getting its picture took." But what did vex and roil was the rank incompetence of editorial censorship of material published for "the advancement of veterinary science"—an overworked phrase of the time. May I dare to mention an article in the *Review* describing "a new cure for tetanus" which never failed. One liter of essence of turpentine and 20 Gm. of gum camphor, to be given as a drench in two doses on two successive days was published without comment. Did you ever try to drench a case of tetanus? Another, taken at random, was a "remarkable surgical operation." The surgeon removed the entire lower jaw of a colt from the incisor teeth to the temporal articulation and the new jaw that regenerated contained teeth. Challenged by a practitioner in a subsequent issue of the journal, the author offered to send the colt to New York as proof "if some one will pay the freight." Remember this was the time I came into the profession. Fortunately, search as one may, there is nothing comparable found in any of the journals published before or since. Is it a wonder that young men were dubious about the leading veterinary journals of that day and welcomed the entrance of Huidekoper and Hoskins into the publication field?

Since America's first veterinary journal (1855) had pled for articles from practitioners, I purchased a second hand caligraph—forebear of the modern typewriter—and began hammering out the trials and errors of every-day work. My first article above the rating of a note was entitled "A Few Words anent Wolf Teeth," six printed pages long, which my friends Huidekoper and Hoskins made the lead article in the January (1898) issue of their *Journal of Comparative Medicine and Veterinary Archives*. Astonished, as much as delighted, at the prominent place given to an article on such a seemingly prosaic subject, Huidekoper remarked that it was "a fine piece of research." Imagine that. A reading of that article now, after forty-eight years, shows two things: (1) It was written from ten years of considerable observation on the incidence, size and shape, relations, structure, eruption, traditional concepts, and the extraction of wolf teeth, and (2) that in writing for publication one should cover only familiar ground to be taken seriously. One of my duties at the McKillip hospital and practice was to "do the dentistry" which in the course of ten years had run into bigger figures than I would now dare to relate. It led to the publication of the book "Animal Dentistry" in 1903. But, besides the rule of staying within one's range of knowledge, long articles were avoided and the editor's style and probable space available were considered. Cuts con-

firming the text were always furnished whenever possible, often at time-consuming trouble.

6.

Radical vs. Tory

In professional life, I've been dubbed a radical. What a compliment! Who wants to miss the thrill of watching conservatives coming up in the rear (after a while) as the radicals go on to the *next* project? The radical makes errors because he takes chances but makes the double plays and bats in the runs. The Tory makes only errors of omission and stays in the minors. He's the standpatter of veterinary progress of whom there are not a few. I have heard standpatters like A. Liautard, D. E. Salmon, Joseph Hughes, A. H. Baker, Roscoe R. Bell, Leonard Pearson, W. B. Craig, Louis Cook, and Sesco Stewart fight against lifting the standards of education on the old let-well-enough-alone idea of progress, and radicals like Rush Shippen Huidekoper, James Law, Veranus A. Moore, Wm. Herbert Lowe, M. H. McKillip, Tait Butler, L. A. Klein, and Charley Cotton engage in heated arguments in favor of higher standards.

Over and over, I've heard W. Horace Hoskins condemn the idea of incorporating the AVMA, which was long advocated by "radicals" in the hope of getting the Association off the borderline of its everlasting impecuniosity and pitiful state of insecurity and small membership. While secretary in 1916, I saw Charley Cotton, the president, do that in a day without ceremony. Then, there was the fifty-year fight against making the AVMA a federation of state associations, the biggest scrap of all and the most repellent. That was a radical versus tory controversy of incomputable detriment. It stopped the advance of veterinary medicine cold in its tracks for many years. The battles were waged largely behind closed doors. The details were beautifully hidden from the membership. Few knew then or now that such a controversy ever existed. Yet, it was the most momentous question and most far-reaching ever settled. The problem of whether the stalemate of five decades could be broken and veterinary medicine in the United States be permitted to proceed was strangely difficult to compass. To avoid objectionable personalities, the details will have to be woven with considerable caution. Suffice to say now that in association work, there is the difference between "let's go" and "let well enough alone." It's the difference between yohimbine and stilbestrol, between the unaided eye and the microscope, between the blood transfusion and the clyster.

7.

Period Covered

The stretch of time covered by these sketches extends through my boyhood and adult life—sixty-one years—that is, from the time there was no veterinary profession in this country and from the very dawn of veterinary schools in the United States. The smoke and din of a great civil war were just fading away. I recall dinner-table talk about Antietam, Appomattox, Lee and Grant, Stonewall Jackson, the assassination of Abraham Lincoln, Uncle Tom's Cabin, and Horace Greeley, quite as vividly as children of today remember the rise of Adolph Hitler and Pearl Harbor.

8.

The Old Veterinary Surgeons

Our first viable veterinary college was still unborn. There were no state associations and the AVMA, after the New York meeting of 1863, had fallen into a sickly slump. The veterinary surgeons called to the farm to treat my father's horses and cows were useful, serious-minded men. Quacks? Oh, no! My country had provided no other and farm stock was precious. Death losses were tragic to the whole family. At no time in United States history were competent veterinarians needed as much. The loss of a horse or a cow struck terror to the horny-handed pioneer. These early veterinary surgeons flourished in every populated community. Their knack in taking the feet from under a horse out in the woodlot of the home farm was too impressive for a curious-minded boy to be soon forgotten. Their exclusive pharmacognostics were no less curative and much safer than the alkaloidal therapy practiced by the quick-made collegians who came strutting in with their hypodermic syringes to replace them a few years later, after the New York and Chicago "mills" began to grind.

Symbolic of the self-educated veterinary surgeons were Thayer, the Wood brothers, and Dadd of Boston; Jennings of New Jersey; Michener of Pennsylvania; Bowler of Ohio; Quitman (P.), Farmer Miles, Bovette, and Swain of Illinois, to name but a few at random. These were the kind of men who *started veterinary education and organization in the United States*, with the

aid of a few scattered graduates of foreign colleges (France, Switzerland, Britain, Germany), none of whom were particularly famous for helping to take that first step in the founding of a veterinary profession. At the present time, as the first century of veterinary education is coming to a close, we ought to be unveiling, at least, mental plaques to their memory; discrimination between them and the first quick-made collegians is out of order. The fine-looking sheepskin, representing a few months of elementary learning, could not immediately match the experience of the old timer.

9.

Gaps to Fill

Having watched these self-made men at work, having competed with them in practice, and having studied their ways and number and affluence, with an eye on founding a three-year school in Chicago, I was never able to work up the habitual hostility to the self-qualified veterinarian, even unto this day. Their number was legion, their affluence imponderable at that time, compared with the feeble potential of the quickly won diploma. Now, as then, the cause is the same—*a gap to fill.*

Always in these mental surveys, one arrives at the same conclusion: "My country provides no one else." So, ambition, capital, and necessity come to the rescue. Goodness, men, there is no difference between the self-made veterinary surgeons of the 1840's and the noncollegiate technicians of 1946, who engage in veterinary work. Or, is that too profound for my thick mind to fathom? I am only trying to *cherchez la femme* and pass the blame to whomsoever it belongs. The twentieth century diatribes flung at the private schools and the noncollegians who treated the sick (before them) spring from our long-lasting ignorance of our own history, as it has continuously unfolded before our eyes. A more-fitting attitude would be for the graduates of the present period to dedicate monuments to the memory of their founders. Or, are we too poker-faced to indulge in that brand of sentiment —too young and care-free to go into the monument-erecting business? In time, we ought to reach that stature. The monuments erected on the campuses are symbols of personal conduct as well as mass achievement. Buildings erected to the memory of Moore at Ithaca, Stange at Ames, and Francis at College Station, represent a change of attitude.

10.

Reform Came Slowly

A notable observation made in the line of duty was the feeble influence of the quick-made graduates when they came bouncing into the borning profession. They didn't turn things right-about-face by a long shot, nor immediately write a new chapter in the annals of veterinary medicine. The noncollegians, who had been on the grounds for years, were the stockman's favorites during the early period of my professional life, and today remain far from having faded from the scene. Men of science or of politics have taken command of the whole shebang. That should never have happened.

All along the years, it was evident that the new college men took their diplomas more seriously than their basic and specialized knowledge justified. In one respect, the new veterinary college graduate was more of a detriment to progress than their self-made antecedents. Besides, the profession had no plan for educating men for the higher, scientific positions. The latter did not underestimate the power of education and organization like so many of the graduates I have known.

11.

How Many

The question of how many veterinarians the United States should have was already time-worn long before my time. In reality, the question of numbers was a leading issue 'way back in the 1850's, when Robert Jennings, of New Jersey, and Isaiah Michener, of Pennsylvania, seized the ideology of Dr. Benjamin Rush—that formal veterinary education should be established somewhere, somehow. (At the turn of the eighteenth century, Dr. Rush suggested chairs of comparative medicine in the medical colleges.) Then, as now, the dissidents of numerical strength argued that more veterinary surgeons meant more business competition. Then, as now, the thought of expanding the field of veterinary medicine did not occur to them. That kind of thinking has done incomputable harm to the advancement of the veterinary profession. It left gaps in the higher bracket for nonveterinary personnel to fill, *ex necessitate rei.*

Bewildered by the situation, I confess having advocated the recognition of both graduates and nongraduates in the building up of the numerically weak manpower of the clinical group, pending the coming of collegiate courses capable of furnishing

graduates for all levels of veterinary science and art. That very Utopia, disguised, came anyway and is now apparently approved. Nongraduates drawn from other branches of science are now the graduates' commanders, just as the nongraduate veterinary surgeons were in the 1850's and we are still failing to educate men to fill their places. It's all very simple but nevertheless basic and grave. The first graduates bumped* the nongraduates who came unchallenged to fill a need. Now we're trying to bump the key men at the top by educating men for the job. "Veterinary medicine for veterinary graduates" has always been the objective but it has never come to pass. Now, as always before, *cherchez la femme* took one forthright to the veterinary college and there the cause could always be apprehended, notwithstanding that the colleges, at every point, always successfully hid their culpability in respect to numbers.

The one-, two-, three-, and four-year schools of yesteryears were always a leap behind the needs of the biggest of the American industries. While we educators (oh, gosh!) of the nineteenth century and beyond did not have precisely the same viewpoint, we thought ourselves tremendous, *and how*—no more nor less than the coterie of 1946. Perish the thought that this is a criticism of man. He who thinks that is shallow indeed. Veterinary medicine of the whole world that I've seen or read about is no different in any essential respect. *It has failed to indoctrinate its purpose understandingly in this civilization.* Personal or collective culpability must be measured by the amount of effort made to correct that age-old deficiency. When the AVMA set out on the scent of that fault, it seems to have struck the right trail. Call it public relations, or what not, there is yet to be taught the fact that human subsistence and general welfare spring only from the farm, the work-place of veterinary medicine.

12.

Horizon Brighter

The veterinary profession of the United States—youthful thing—now has a brighter horizon. The low standard idea of Liautard and others has been kicked out after long years of effort. The fifty-year effort to federate the state associations was won in 1933; a full time Board of Governors keep vigil over association affairs; a guardianship fought off until the 1930's has been established for American veterinary science; machinery "to plan and to do" has been installed; and we do have a real veterinary educational system to signalize and build up. So, two of the factors uppermost in mind for years —organization and education—are surging upward. The welfare of the clinician who travels the road to the farms remains to be handled, with the machinery set up to do so.

In writing a narrative of this living issue, the advantage of having lived with it since 1886 is something to be thankful for. To paraphase, it is, however, the expression of but one mind. The once powerful pack (the low standard crowd) that hoped to trace the anise bag surging and howling to the kill has been driven from the field. The depressing quarrels among the colleges and other groups having axes to grind lie in the past and, thanks to the coming of more resourceful young men into the profession, veterinary medicine is likely to be appraised more nearly for its actual value by the people. That, in the final analysis, is what organized veterinary medicine seeks to achieve, not solely for itself but also for a world to which the farmers of the United States are destined to lend increasing moral and material contributions in the coming years. The breakers ahead (there will always be breakers) are for the guardians of the livestock industry to negotiate.

The writing of this series of sketches is taken as a duty, an unfinished task, a sort of valedictory for the records, written in the only style of composition I know (satire). Forever to remain unpaid, however, are the honor of having been called to nearly every state of the Union and province of Canada, as a private practitioner, to contribute to the programs of their veterinary medical societies, and for the token meetings held in recognition of my fiftieth anniversary in the profession by the Illinois, Eastern Iowa, and Wisconsin associations in 1938. Crowned with life membership in the AVMA and awarded the International Veterinary Congress Prize by longtime colleagues of the Association, I still serve cheerfully as an

Obedient servant (I hope),

January, 1946. L. A. MERILLAT

(To be Contined.)

**Bump* is a railroad term used when an employee entitled to the job replaces the occupant hired to fill a gap—regardless.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Hernia in Horses and Cows

JAMES FARQUHARSON, D.V.M.

Fort Collins, Colorado

HERNIA is a protrusion of a viscus or viscera through a natural or an abnormal opening in the body wall, in which the skin remains intact. While the term hernia can apply to other portions of the body, in farm animals it refers to defects of the abdominal wall, unless qualified. Rupture is commonly used by laymen as a synonym, although it infers forceful tearing of the muscular wall. Hernia must be differentiated from prolapse, which is a protrusion of an organ through a normal external body opening.

The incidence of hernia cannot be accurately estimated as only the clinics have kept records, and even these are not reliable because at each there is a degree of specialization. Umbilical hernia in equine and bovine animals constitutes half or more of all cases, followed by scrotal and ventral hernias in that order. Ventral hernias occur about three times more often in the female than in the male, while scrotal hernias are rarely observed among calves despite the large number castrated each year.

The anatomy of hernia is well defined. The ventral wall extends from the xiphoid cartilage to the pubis, and is made up of the abdominal muscles and their aponeuroses. The linea semilunaris, seldom mentioned by veterinary anatomists, is the most unyielding portion, and therefore is most likely to give way under the impact of violence. The linea semilunaris is that portion lateral to the lateral border of the rectus abdominis muscle, and it is formed almost entirely by the combined aponeuroses of the internal and external oblique muscles supported deeply by the transversus muscles. Resiliency of a tissue is a defensive mechanism for absorbing shock in violent external trauma, so that herniation is most likely to occur where mobility is least evident, that is, close to the last rib or costal arch, the linea alba anterior to the umbilicus, the linea semilunaris (lateral border of the rectus), and the aponeurotic triangle in the region of the fold of the flank.

Etiologically, hernias have been classified into three groups: congenital, acquired, and traumatic; but the acquired group should be omitted as it is so loosely used. A better classification would be: nontraumatic and traumatic.

Nontraumatic hernia occurs as a result of developmental imperfection, and becomes clinically evident at birth, during the juvenile period (the first few weeks), and in adulthood (dormant or delayed hernia caused from effort). These occur at the internal inguinal ring and the umbilicus. Heredity has been shown to be a definite factor in hernia present at birth. Straining in defecation, passing over and under obstacles, abscessing of the umbilical stump, rearing, bucking, and playing may be exciting causes of the juvenile type. Delayed hernia, usually scrotal, is seen most often in mature breeding animals—stallions and beef bulls, particularly.

Traumatic hernia is the result of a violent impact without predisposing weakness. Kicks, falls, horn thrusts, jumps onto post tops, etc., runaway accidents, and collision with autos are common causes. The hernia does not always occur at the point of impact but at the point of least resiliency, as already indicated. Incisional hernia is infrequent.

This is an abstract of a chapter of Dr. Farquharson's book, now in preparation. Dr. Farquharson is head of the Department of Veterinary Surgery, Colorado A. and M. College.

Structure of the hernia is in three parts: the sac, its coverings, and its contents. The sac is a diverticulum of the parietal peritoneum which consists of a neck, a mouth, and a fundus. There may be inflammatory adhesion and thickening at various points. The coverings will depend upon the type of the hernia. They may be only skin; skin and fascia; or skin, fascia, and muscle in the sliding type of hernia. The contents vary with duration, size, position, and intra-abdominal pressure. They may be fat and omentum; fat, omentum, and small intestine; or they may include a portion of the colon or the tip of the cecum. The bladder rarely may be included.

The pathologic conditions of the hernia center around the hernial ring, but they varies with the tissues involved, the arrest of function of the parts imprisoned, and the interference with circulation. Strangulation may occur from closure of the ring by a change in the angle of the tissues forming the ring, by the muscular rigidity which adds to, if not directly causes, closure, by sliding of layers of the peritoneum to act as a valve, or by increase of pressure in the bowel from obstruction with food or gas. With strangulation, the sacculation becomes tense and tender. The danger in strangulation is associated with gangrene of the contents followed by peritonitis, septicemia, shock, and death.

Hernia may be reducible or irreducible and, in the latter event, operation may be a matter of choice or of necessity. Preoperative considerations center around the physical condition of the animal. Time is not pressing unless there is strangulation. In most cases there is time to empty the bowel by starvation. No animal is a good surgical risk if parasitized, anemic, unthrifty, or emaciated.

An operative arena of clean grass, away from barn and corral, is best because it is free from dust and contaminating bacteria. In order to get proper relaxation, general anesthesia must be used. For this, a 7 per cent solution of chloral hydrate, injected intravenously until all reflexes are abolished, is best for the horse and cow, and is used most frequently. Nembutal, intravenously, is highly satisfactory in colts.

The technique of the operation is essentially the Mayo operation adapted to the quadruped. It is simple, easily mastered, practical, can be performed without assistants, and has many advantages over the clamp method. When the animal has been anesthetized and cast, it is placed in operating position and the field is protected with a sterile shroud. After suitable cleansing of the field, an elliptical incision is made, through the skin only, around the umbilical cicatrix; this island of skin is removed from the underlying peritoneum by precision or by blunt dissection. Follow carefully along the peritoneum, down to the neck of the hernial sac, and undermine the rectus muscles for a short distance on the inside of the ring, being sure to break down all of the fibrous union between the hernial ring and the neck of the sac while staying outside the peritoneum. The hernial sac is now inverted into the peritoneal cavity.

Overlapping mattress sutures of no. 24 kangaroo tendon or no. 4 forty-day chromic catgut are inserted, beginning the series 1 inch above the edge of the upper lip of the ring. The needle is carried through the entire thickness of the muscle, using a finger as a guide to protect the peritoneum from puncture. Cross to the lower lip and go down through this in a similar manner, then come up parallel to the ring and emerge about one-half inch from the point of insertion. Carry it back to the upper wall and come up again one-half inch from the point of insertion. Other sutures are now inserted in a similar manner one-half inch apart to cover the entire defect before any attempt is made to tie. The sutures are then pulled so that the lower lip slides under the upper lip in overlapping position, and tension is maintained to hold this position until the sutures are progressively tied.

Now the exposed edge of the upper lip is sutured to the adjacent abdominal wall with a continuous no. 4 chromic catgut to hold it in position. Sulfanilamide may be dusted into the wound before the skin is closed with no. 3 tension suture. Collodion and gauze will protect the incision and the sutures may be supported with adhesive tape completely around the abdomen. Tetanus antitoxin should be administered, the casting harness removed, and the animal permitted to lie quietly until ready to

get up after the anesthetic has worn off. Postoperative care includes keeping the animal on light feeds to prevent overloading and gas production, and removal of the skin sutures at the end of ten days.

As in all surgery, success rests upon a firm foundation consisting of a balanced blending of science and art, of vision and daring, of good judgment, and humanitarian consideration for the patient and those persons interested in him. Good surgical judgment is acquired only after good theoretical training and years of practical experience and observation. The object of surgery is to relieve pain, restore function, and save life; to inflict needless pain brings condemnation to the individual and disgrace to the profession. The field is full of operators, but there are few surgeons, because to operate skillfully is not sufficient for the aims of surgery.

The Maternity of a Colt Determined by Blood Grouping

Confronted with the problem of detecting which one of two dams, *Fanny* or *Clairette*, was the mother of colt *Robert*, the authors employed a technique for determining maternity that plays an important rôle in medical jurisprudence.

Blood groups, evidently distinct from those of man, are known to exist in horses. Stallion serums were prepared in the same manner as in the grouping of human blood for that purpose. The results of the agglutination with the serums of the three animals were as follows:

The mare *Fanny* belonged to group AB; that is, her red blood cells contained agglutinins A and B, and her serum no agglutinins. *Clairette* belonged to group A, meaning that her red cells possessed agglutinin A and her serum anti-B. *Robert*, the offspring, was a group O, signifying that his red cells did not contain any agglutinin and his serum possessed agglutinins anti-A and anti-B, or α and β.

The results were read by the principles of genetics as in man. The heredity of blood groups conforms to the laws of Mendel: A and B are the dominant genes for O—the recessive genes. According to this law, when the blood groups of the parents are known, the offspring can be classified by the following schema:

Parents	*Offspring*
O x O	O
O x A	O, A
O x B	O, B
A x A	O, A
B x B	O, B
A x B	O, A, B, AB
O x AB	A, B
A x AB	A, B, AB
B x AB	A, B, AB
AB x AB	A, B, AB

According to this formula, *Fanny*, a group AB dam, could yield only A and B offspring and, therefore, could not have given birth to *Robert*, a group O foal. On the other hand, *Clairette*, being a group A dam could have either *a*, AB, and O foals depending upon the sire. *Robert*, the offspring in question, being a group O, could, therefore, not be the son of *Fanny* but could be the son of *Clairette*. Moreover, the individual somatic characters of the three animals confirmed the conclusions drawn from the blood examinations.

The authors believe that the results obtained present a certain amount of interest because the investigation was believed to be the first reported practical application of blood grouping to establish parentage in horses. But of greater interest, in view of the precise results obtained, is the prospect of such investigations rendering service in connection with the confirming of pedigrees in breeding animals. The work was carried out in the Serological Laboratory of the Pasteur Institute.—*Drs. N. Kossovitch and E. Usse: A Case of the Application of Blood Grouping to Determine Maternity in Horses. Title translated. Bull. Acad. Vét. de France, 18, (Oct. 1945): 230-231.*

Metopryl

Metopryl (n-propyl methyl ether) is a new surgical anesthetic, less irritating, with less disagreeable after-effects and more power than ether. It gives more pronounced muscular relaxation with equal safety in long operations and has a pleasant odor. Metopryl was developed by Dr. John C. Krantz, School of Medicine, University of Maryland.

No method of predicting the sex of chicks in the egg is reliable.

Artificial Insemination in General Practice

Commenting on the JOURNAL'S contention that artificial insemination of dairy cattle and others should be retained within the ambit of general practice, a Midwesterner writes: "I was invited to attend the meeting when the breeding society was formed but did not go because I already have more than I can do." As the letter has the ring of honest opinion applicable in general throughout the country, we may have been barking up the wrong tree, *i.e.* blaming the wrong party, but the fact remains that artificial insemination is developing rapidly with the majority of the logical technicians (veterinarians) watching enthusiastic dairymen having laymen trained to do the work and, to repeat, letting a new and useful segment of practice slip by, unabashed.

The U. S. Bureau of Animal Industry, the agricultural experiment stations, and the veterinary journals have done their part in describing methods of artificial insemination for all species of livestock but the profession is not able to provide the necessary personnel. The next place to "case" is the source of supply.

Notes on Surgery and Breeding

Of the many methods proposed for controlling the sex of chicks, none is dependable.

A rope sling under the legs works better than a wide band under the belly for raising cows.

The veterinarian should use anesthesia when castrating old boars. Failure to do so encourages inhumane castration.

Five pigs must be weaned from a sow to make her profitable. Most men are satisfied if they can wean 6 pigs, thus realizing a profit of 1 pig; but if 7 pigs can be weaned the profit is twice as great.

Mating boars from inbred lines to non-inbred sows results in about 100 lb. more weight per litter when the pigs are 6 months old, says a release from the Regional Swine Breeding Lab., Ames, Iowa. Crosses of inbred lines within a breed promise still more pork per mating.

During the gestation period, a sow will consume from 1,500 to 2,000 lb. of feed, Illinois experiments show.

An orphan colt may be raised on a mixture of 20 oz. of cow's milk and 12 oz. of lime water, fed at the rate of 4 oz. every two hours during the first two weeks of life.

A bladder which has been distended and then displaced to occupy the pelvic canal, where it interferes with parturition, can be drained with a small cannula.—*Dr. A. J. Legner.*

The American Kennel Club will not accept for registration dogs produced by artificial insemination. The decision was reached after due consideration, despite reports that many litters are produced that way.

Every 50 chicks in the brooder house should have one water fountain with a capacity of 1 gallon.

Most developments that make livestock production more efficient trace, directly or indirectly, to research in breeding, feeding, management, and disease control.—*New Jersey Agric. Inform., March 5, 1946.*

The weight (size) of a pullet's first eggs depends upon the season she was hatched, her age, her weight, and the kind of feed she has received. The maximum size of her eggs may be reached at from seven to fifteen months depending, to a considerable extent, upon the same factors.

A sow lies with her back uphill, says *Breeders' Gazette* (March 1946). It suggests that raising one edge of the farrowing house 1 ft. and placing a guard board 1 ft. wide 10 in. above the floor at the low side to provide a nesting place for the pigs, may save 2 pigs per litter.

CLINICAL DATA

Penicillin in Peanut Oil with 3 Per Cent Beeswax; Local Use in Bovine Staphylococcal Mastitis

JOHN W. WALKER, V.M.D.
Philadelphia, Pennsylvania

MASTITIS is a serious problem of the dairy industry. The most important infective agents are certain staphylococci and streptococci. *In vitro* tests demonstrated that one species, *Streptococcus agalactiae*, is very sensitive to penicillin. This is the organism responsible for most cases of catarrhal mastitis. The type of staphylococcus found in cases of parenchymatous mastitis is also sensitive to penicillin.

REVIEW OF LITERATURE

Klein *et al.*[1] have stated the indication for the use of penicillin therapy in bovine mastitis and also the rationale of most bacteriologic procedures followed at this institution.

Kakavas [2] was the first to publish results of work with penicillin in bovine mastitis. He used a crude filtrate, giving 3 to 8 doses containing 600 to 1,200 units each at 24-hour intervals, and eliminated the *Str. agalactiae* infection from 21 of the 23 quarters. Later, using sodium penicillin in distilled water, he gave 3 to 8 doses at 24-hour intervals, containing 1,000 to 15,900 units each, and eliminated *Str. agalactiae* from 19 to 24 quarters. Using sodium penicillin in distilled water, he gave 3 to 7 doses containing from 600 to 9,000 units each and eliminated pathogenic staphylococci from 20 of 33 quarters.

Klein *et al.*[1], treating quarters infected with pathogenic staphylococci, infused 22,800 units of sodium penicillin in 500 cc. of normal salt solution every twelve hours for 4 doses and was not successful in clearing any of 3 quarters treated. When he administered the same dose at six-hour intervals for 8 doses, he eliminated the infection from 2 of the 4 quarters treated. Since the present work has been in progress, three other papers have been published. A brief summary of their results follows, and the details are tabulated (*see* table 3).

Bryan *et al.*[3] used 100 units of sodium penicillin per cubic centimeter of sterile distilled water or saline. When 1 to 3 doses of 1,000 to 20,000 units each were administered, *Str. agalactiae* was eliminated from all 32 cows treated. Udders with marked induration were not included.

Slanetz *et al.*[4], using 1, 2, and 4 doses of 100,000 and 200,000 units of sodium penicillin in 100 cc. of sterile saline or distilled water, eliminated the *Str. agalactiae* from 55 of 59 quarters treated in 31 of 33 cows. Using 4 similar doses, he eliminated staphylococci from 11 of 14 quarters in 6 of 8 cows.

Murphy and Pfau[5], using 1 to 5 doses of 5,000 to 200,000 units of sodium penicillin in 50 to 300 cc. of boiled distilled water, eliminated *Str. agalactiae* from 43 of 64 quarters treated. Eleven of these represented retreatments, and 1 was a new infection in a previously treated quarter. All 32 quarters, treated with 5 doses of 20,000 units each, responded.

A brief report by the U. S. Bureau of Animal Industry and the University of Maryland[6] states that, when a filtrate containing 68 to 95 units of penicillin per cubic centimeter was used, *Str. agalactiae* was eliminated from 58.8 per cent of 76 quarters; other types of streptococci were eliminated from 48.5 per cent of 19 quarters, and staphylococci were eliminated from 60.0 per cent of 5 quarters.

Klein, Kakavas, Bryan, Slanetz, and Murphy, and their associates, reported only a mild reaction on the part of the udder. This was usually manifested by flakes in the foremilk and a temporary drop in production. Klein reported 1 quarter that became swollen and hard but returned to normal in three days.

The udder is easily irritated by infection or any agent injected into it as a treatment. Pen-

This work was done in the Schools of Veterinary Medicine and Animal Pathology, of the University of Pennsylvania, which received financial support from the United States Department of Agriculture and the Department of Agriculture of the Commonwealth of Pennsylvania.

The penicillin was supplied by Chas. Pfizer and Co., Schenley Laboratories, and E. R. Squibb & Sons. The potency of the penicillin as supplied is stated at the end of the article.

icillin's freedom from irritating properties and its effectiveness in small amounts, especially in the presence of body fluids, such as milk, indicated its value as a local treatment for mastitis. The selection of a vehicle that did not produce irritation was also important. The vegetable oils were found satisfactory. Romansky[7] has injected 100,000 units of calcium penicillin per cubic centimeter of peanut oil containing beeswax, intramuscularly, into human beings and did not find physical evidence of irritation. He showed this preparation had the added advantage of greater stability (not requiring refrigeration), and that it retained the penicillin longer, thus maintaining effective concentrations between treatments. To increase dispersion, the concentration of penicillin per cubic centimeter was reduced to 1,000 units and a greater volume injected *via* the teat canal.

PROCEDURE

Three milk samples were collected at least a week apart for laboratory examination before treating a quarter, except in the acute cases requiring immediate treatment. All samples of milk were collected just before a regular milking. The udder was first washed and dried. The lower third of the teat was then thoroughly cleaned with alcohol. The first few streams of milk were examined for change in physical appearance, and discarded. Then approximately 20 cc. of foremilk was collected in a sterile 30-cc. vial, care being taken to avoid contamination. Hotis samples were collected at the same time. The number of samples taken after treatment is indicated in the various experiments. The samples were kept in a refrigerator over night. Next morning 0.05 cc. of milk from each sample was plated in ox-blood agar. The remainder was incubated eighteen hours and a smear prepared, stained with Newman's stain, and examined microscopically for number of leucocytes and type of organism present.

After 24 hours of incubation, the ox-blood agar plates were examined, and typical colonies picked into veal infusion broth, adding 1/2 cc. of ox-blood plasma if growth was tardy. These broths were examined for pure culture.

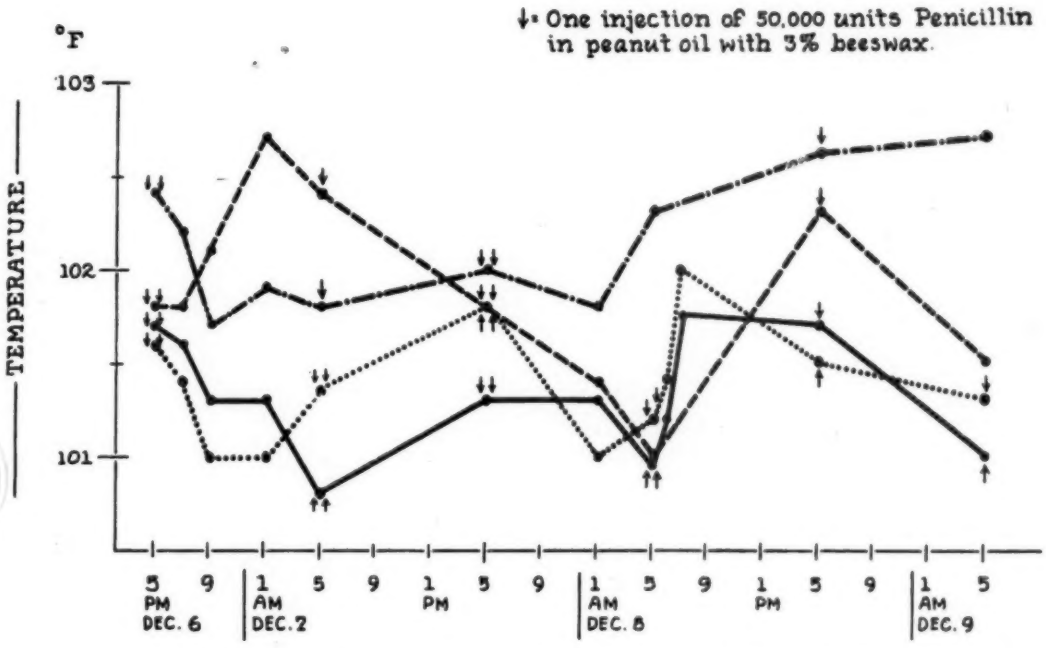
In the case of the streptococci, broths were inoculated containing Andrade's indicator and the following carbohydrates: salicin, sorbitol, trehalose, and mannite. These were examined for fermentation after one, two, and five days of incubation. Methylene blue milk was also inoculated and examined. The pH of glucose broth was determined after five days of incubation

TABLE I—Penicillin in Peanut Oil with 3 Per Cent Beeswax

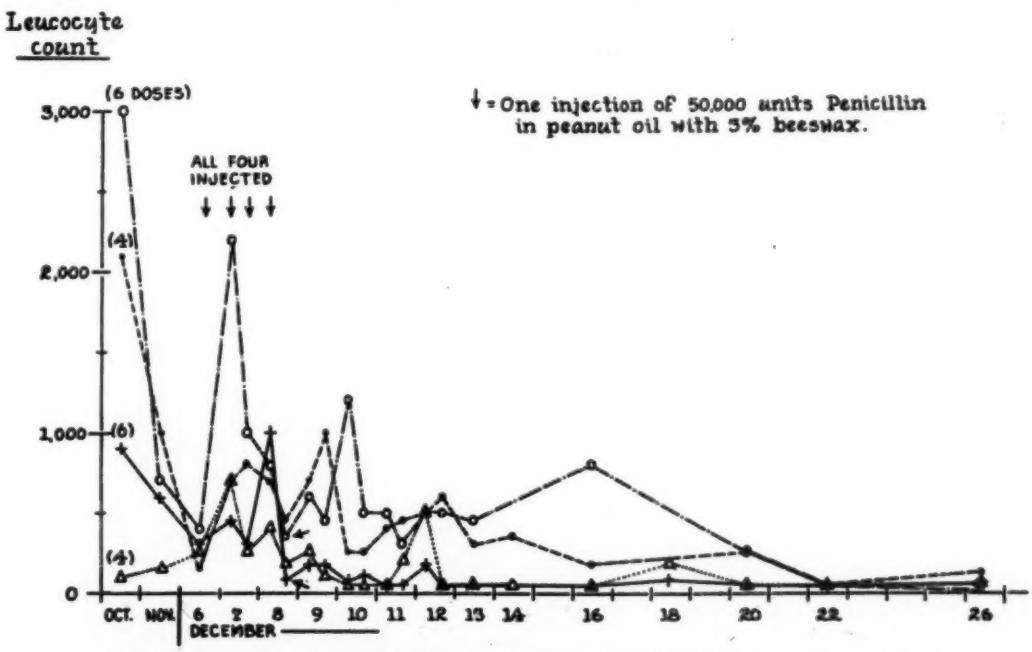
No. of Cows*	No. of Quarters	Unit per Dose	No. of Doses	Interval Between Doses (Hours)	Total Units	Vehicle	Infection	Quarters Responding	Time of last Examination	Still Neg. (No.)	Still Neg. (%)	Sanitation
(Pen 1A) 2	2	50,000	6	12	300,000	3% Beeswax In Peanut Oil Concentration of 1,000 units per cc.	*Path.	2 (100%)	12 wks.	2	100	Controlled
2	2	50,000	4	12	200,000		Sta.	2 (100%)	12 wks.	2	100	Controlled
(Pen 2) 3	6	50,000	3	3-12	150,000			6 (100%)	7 wks.	4	66 2/3	Not cont.
				3-24								
2	8	50,000	2	4-12	100,000		Path.	8 (100%)	7 wks.	6	75	Not cont.
				4-24								
2	5	25,000	3	1-12	75,000		Sta.	1 (20%)	7 wks.	1	20	Not cont.
				4-24								
1	1	25,000	2	24	50,000			None	7 wks.	0	0	Not cont.
(Pen 3) 13	19	15,000	2	24	30,000		Path. Sta.	12 (63%)	10 wks.	9	47	Not cont.
(Pen 4) 13	17	15,000	2	24	30,000		Path.	17 (100%)	Variable	11	65	Not cont.
1	1	50,000	6	12	300,000		Sta.	1 (100%)	7 wks.	Neg. for 1 mo. 0		
(Pen 5) 7	10	15,000	1	..	15,000		6 Path. Sta.	None	4 wks.	0	0	Not cont.
							2 Str. agalactiae	None	4 wks.	0	0	Not cont.
							1 Str. uberis	1 (100%)	4 wks.	1	100	Not cont.
							1 Coliform	None	4 wks.	0	0	Not cont.
(Pen 6) 10	15	15,000	3	24	45,000		9 Path. Sta.	2 (22%)	2 wks.	2	22	Not cont.
				Retreatment			5 Str. uberis	4 (80%)	2 wks.	4	80	Not cont.
							1 Str. agalactiae	1 (100%)	2 wks.	1	100	Not cont.

*Only lactating cows listed in tables.

TEMPERATURE AND INJECTION CHART



Temperature of individual cows at four-hour intervals when injected with four or six doses of 50,000 units each of penicillin.



Number of leucocytes in milk (000 omitted) per quarter after injecting four or six doses of 50,000 units each of penicillin.

*Only lactating cows listed in tables.

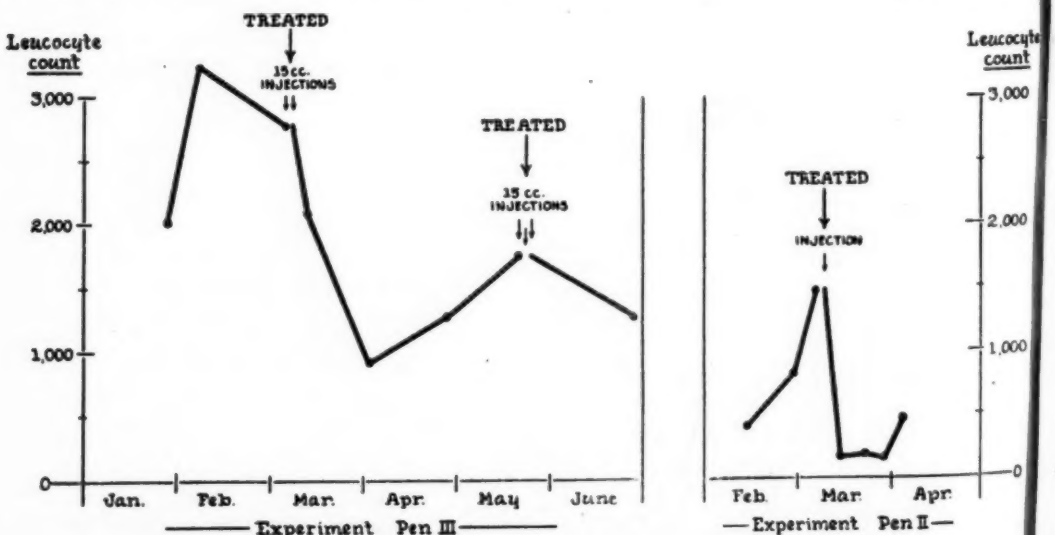
and presence or absence of growth was noted in the presence of 6.5 per cent sodium chloride. The ability to split aesculin and sodium hippurate was also determined.

In the case of the staphylococci, broths were inoculated containing Andrade's indicator with mannite and lactose. An agar slant was also prepared. After twenty-four hours of incubation, a 4-mm. loopful of growth from the agar slant was placed in 1/2 cc. of fresh rabbit plasma and examined for coagulation after one, two, and three hours.

After establishing the presence of a pathogenic infection in a quarter, it was milked dry at a regular milking time and the peanut oil, containing 3 per cent beeswax, and penicillin was injected through a sterile 19-gauge teat cannula into the teat canal. A sterile 50-cc. glass syringe was used. The udder was massaged gently.

The first two problems were to establish the effectiveness of the preparation in eliminating the infection from the gland, and to determine the amount of irritation produced, if any. We decided to begin with doses of 50 cc. of peanut oil with 3 per cent beeswax, containing 50,000 units of sodium penicillin. If a cow is treated while dry, *i.e.*, not lactating, the preparation injected is not washed from the udder by frequent milkings and few doses are required. For this reason, the first experiment (pen 1) is divided into two parts: "A", the treating of lactating cows, and "B", the treating of dry cows.

Experiment Pen 1A.—Two lactating cows were selected, each having 3 quarters infected with pathogenic staphylococci and 1 negative quarter. One quarter in each cow received 6 successive injections at twelve-hour intervals of 50 cc. of peanut oil with 3 per cent beeswax, containing 50,000 units of sodium penicillin. Another quarter of each cow received 4 successive injections at twelve-hour intervals of 50 cc. of peanut oil with 3 per cent beeswax, containing 50,000 units of sodium penicillin. The remaining infected quarter in each cow was left as a positive control. The fourth quarter in each cow acted as a negative control. The quarters were milked dry at the end of each twelve hours, and the teats were sealed with collodion between milkings to prevent the entrance of infection. Good sanitation was practiced. Immediately upon treatment, the milk from all treated quarters was freed of the infection and remained so throughout the test period of one month. All quarters were still negative after three months. The presence of penicillin in the quarters forty-eight hours after injection was demonstrated. Penicillinase was added to some quarter samples as soon as collected, to prevent the *in vitro* action of penicillin. This did not change any of the readings. The quarters infected, but not treated, remained infected, and the negative quarter on each cow remained



Number of leucocytes in milk (000 omitted) per quarter.

negative (*see* charts pen 1A). Temperature charts, leucocyte count, and physical examination of the gland did not reveal any signs of irritation. The production of milk was maintained; the physical properties of milk were unchanged, and except for the presence of oil and beeswax in the milk, it was impossible to determine which quarter had been treated (*see* table 1).

Experiment Pen B.—Two quarters in each of 2 dry cows infected with pathogenic staphylococci were treated with 3 doses each of 50 cc. containing 1,000 units of penicillin per cubic centimeter. One quarter of each cow received the injections at twelve-hour intervals; the other quarter in each cow received the injections at twenty-four-hour intervals, and the quarters were milked out before each injection. No sign of irritation was noted. The quarters treated were negative when the cows freshened, but all developed a similar pathogenic staphylococcic infection soon after. No sanitary control was exercised over these animals. In pen 1A and pen 1B, the preparation was mixed in our laboratory and Pfizer's sodium penicillin was used.

Fifty vials, containing 100,000 units of calcium penicillin in 100 cc. of peanut oil with 3 per cent beeswax, was supplied by E. R. Squibb & Sons; it was decided to use it under field conditions to find the effect

TABLE 2—Penicillin in Peanut Oil with 3 Per Cent Beeswax

Exp. No.	Cow	Quarters	Dosage	Infection	Result
1A	2	2	6 doses (300,000 u.) of 50 cc./quar. at 12-hr. intervals	Path. Sta.	Treated quarters free from infection from time of treatment to last test, 3 mo. after treatment.
	2	2	4 doses (200,000 u.) of 50 cc./quar. at 12-hr. intervals	Path. Sta.	Untreated quarters remained infected.
2	2	2	3 doses (150,000 u.) of 50 cc./quar. at 12-hr. intervals	Path. Sta.	All clear to last test 7 weeks after treatment.
	1	4	2 doses (100,000 u.) of 50 cc./quar. at 12-hr. intervals	Path. Sta.	All clear to 19th day; 2 then developed reinfection.
	1	4	3 doses (150,000 u.) of 50 cc./quar. at 24-hr. intervals	Path. Sta.	2 were clear as long as tested—2 weeks. 1 was clear for 19 days; was found to be reinfected after 7 weeks. 1 was clear for 13 days; was found to be reinfected after 19 days.
	1	4	2 doses (100,000 u.) of 50 cc./quar. at 24-hr. intervals	Path. Sta.	All clear as long as tested—7 weeks.
	1	1	3 doses (75,000 u.) of 25 cc./quar. at 12-hr. intervals	Path. Sta.	Sterile as long as tested—7 weeks.
	1	4	3 doses (75,000 u.) of 25 cc./quar. at 24-hr. intervals	Path. Sta.	Tested on 13th day and found infected.
	1	1	2 doses (50,000 u.) of 25 cc./quar. at 24-hr. intervals	Path. Sta.	Tested on 13th day and found infected.
3	13	19	2 doses (30,000 u.) of 15 cc./quar. at 24-hr. intervals	Path. Sta.	On 10th day 12 of 19 quarters were clear of infection. After 4 weeks 10 of 19 quarters were clear of infection. After 10 weeks 9 of 19 quarters were clear of infection.
6	6	9	3 doses (45,000 u.) of 15 cc./quar. at 24-hr. intervals	Path. Sta.	Tested after 2 weeks 2 of 9 were clear (from same herd as Exp. 3).
5	5	6	1 dose (15,000 u.) of 15 cc./quar.	Path. Sta.	
	1	2	1 dose (15,000 u.) of 15 cc./quar.	*Str. agalactiae*	Only one quarter responded. It was the one infected with *Str. uberis.*
	1	1	1 dose (15,000 u.) of 15 cc./quar.	*Str. uberis*	

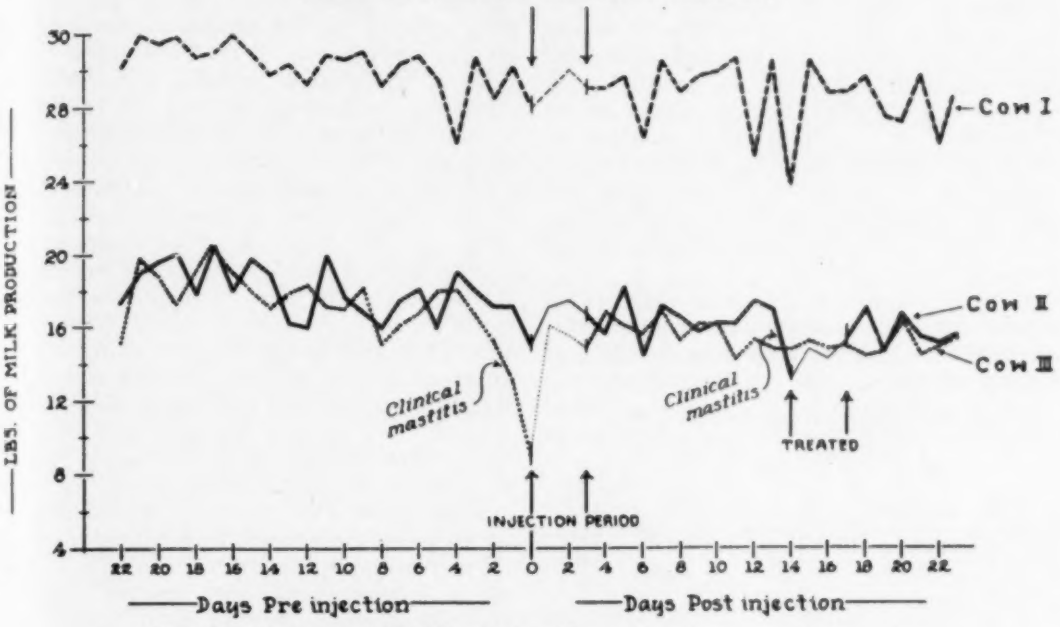
U = Units.

TABLE 3—Use of Penicillin in Bovine Mastitis

No. of Cows	No. of Quarters	Units per dose	No. of doses	Interval between doses (hr.)	Total Units	Vehicle	Infection	Responding Quarters	Reference
	4	22,800	8	6	182,400	500 cc. of	Sta.*	2 (50%)	Klein
	3	22,800	4	12	91,200	Saline	Sta.*	None	
	23	600-1,200	3-8	24	1,800- 9,600	Crude filtrate	Str. agalactiae	21 (91%)	
	27	600-2,300	3-4	24	1,800- 9,200	Dist. water	Sta.	16 (59.2%)	Kakavas
	6	1,200-9,000	3-7	24	3,600- 63,000	Dist. water	Sta.	4 (66.66%)	
	24	1,000-15,900	2-8	24	3,000-127,200	Dist. water	Str. agalactiae	19 (79%)	
2	8	1,000-20,000	1		1,000- 20,000		Str. agalactiae	8 (100%)	
4		5,000-	1		5,000	Sterile	Str. agalactiae	** (100%)	
2		5,000-	2	Not	10,000	water	Str. agalactiae	** (100%)	
12		10,000-	1		10,000	Concentration	Str. agalactiae	** (100%)	Bryan
3		10,000	2		20,000	of 100 u.	Str. agalactiae	** (100%)	
1		10,000	3	Stated	30,000	per cc.	Str. agalactiae	** (100%)	
6		12,500	1		12,500		Str. agalactiae	** (100%)	
2		12,500	2		25,000		Str. agalactiae	** (100%)	
6	10	200,000	1	12	200,000		Str. agalactiae	10 (100%)	
6	9	200,000	2-4	12	400,000-800,000	100 cc. of	Str. agalactiae	9 (100%)	
10	18	100,000	1	12	100,000	either	Str. agalactiae	15 (83.33%)	
4	12	100,000	2	12	200,000	Sterile	Str. agalactiae	11 (92%)	Slanetz
7	10	100,000	4	12	400,000	saline	Str. agalactiae	10 (100%)	
1	1	200,000	4	12	800,000	or water	Sta.	1 (100%)	
4	5	100,000	4	12	400,000		Sta.	5 (100%)	
3	8	Not Stated	Not Stated	Not Stated	Not Stated		Sta.	5 (62.5%)	
5 (Exp. 1)	15	5,000-200,000	1	12	5,000-200,000	Boiled	Str. agalactiae	5 (33.33%)	
3 (Exp. 1)	7	35,000 or 31,500	Retreat.	12	35,000 or 31,500	Dist. water	None		Murphy
4 (Exp. 2)	10	10,000	5	12	50,000		Str. agalactiae	6 (60%)	
13 (Exp. 3)	32	20,000	5	12	100,000		Str. agalactiae	32 (100%)	
	76					Filtrate	Str. agalactiae	(58.8%)	
	19	Not Stated	Not Stated	Not Stated	Not Stated	68-95 u.	Other Strep-	(48.5%)	U.S.B.A.I.
	5					per cc.	tococci Sta.	(60%)	U. of Md.

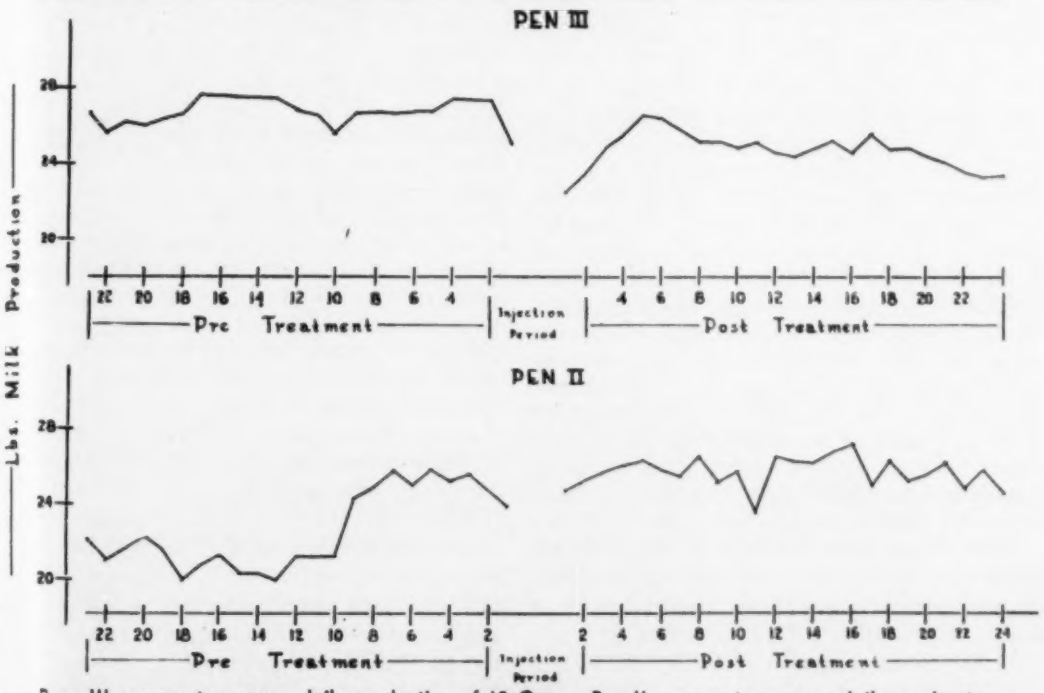
*Pathogenic Staphylococci. **Number of quarters not stated. U = Units.

Pens I and II—Daily Milk Production Before, During, and after Treatment with Penicillin in Peanut Oil with 3 per cent Beeswax.



Cows I and II received 500,000 units in udder in three days; cow III received 150,000 units in udder in three days.

Average Daily Milk Production
Experiments



Penn III represents average daily production of 13 Cows. Pen II represents average daily production of 8 Cows.

of smaller and fewer doses. A practice of skipping milkings was introduced. A cow is ordinarily milked at twelve-hour intervals. When treated at 24-hour intervals, the intervening milking is omitted and the cow is not milked for twenty-four hours after the last injection. This practice of skipping milkings was inaugurated in order to prolong the action of the drug, and the "filling" of the udder at the normal milking time carried the therapeutic agent to all parts of the gland.

Experiment Pen 2.—Twenty quarters in 8 cows, all infected with pathogenic staphylococci, were treated according to the following schedule:

Fourteen Quarters Receiving 50-cc. Doses

Cows	Quarters	Injections	Intervals	Number Responded	Number Neg. at 19 days	Number Neg. at 7 wks.
2	2	3	12 hours	2 (100%)	2 (100%)	2 (100%)
1	4	2	12 hours	4 (100%)	4 (100%)	2 (50%)
1	4	3	24 hours	4 (100%)	3 (75%)	2 (50%)
1	4	2	24 hours	4 (100%)	4 (100%)	4 (100%)

Six Quarters Receiving 25-cc. Doses

Cows	Quarters	Injections	Intervals	Responded
1	1	3	12 hours	Neg. at 7 weeks
1	4	3	24 hours	None
1	1	2	24 hours	None

Two weeks after treatment, it was found that 5 quarters in 2 cows had not responded, and that 15 quarters in 6 cows had been freed of the infection. A week later, a similar infection was found in 3 more quarters of 2 more of the 6 cows, and at the end of seven weeks in still another quarter of these 2 cows. Thus, seven weeks after treatment, 11 quarters in 4 cows were free of the infection, while 9 quarters in 4 cows were infected as they had been before treatment. Of the 9 quarters in which recurrence of the infection was observed, 4 were in 1 cow. The udder was extensively indurated when treatment was begun. Conditions in this stable were not such as to insure against reinfection (*see* table 1).

Experiment Pen 3.—In another herd, 19 quarters in 13 cows infected with pathogenic staphylococci were treated with 2 doses each of 15 cc. of peanut oil with 3 per cent beeswax containing 1,000 units per cubic centimeter of calcium penicillin Squibb. The intervening milking was omitted, and the cow was not milked for twenty-four hours following the last injection. Twelve of the lactating quarters in 10 cows responded, 7 in 3 cows did not. Four of these latter were in 1 cow whose udder was extensively indurated. The other 3 quarters in this group also showed induration. However, at the end of ten weeks, a pathogenic staphylococcic infection had returned in 3 more of these treated quarters. At this time, of 19 quarters in 13 cows treated, 9 quarters in 8 cows were still free of infection, and in 10 quarters in 5 cows, the infection had returned. Attention should be called to the fact that many of the quarters treated were so severely damaged that they would not ordinarily have been treated. No special sanitary precautions were taken beyond those ordinarily found in dairy barns (*see* table 1).

Experiment Pen 4.—Seventeen quarters in 13 cows have been treated for parenchymatous mastitis from which a pathogenic staphylococcus was isolated. All responded immediately. In 6 of these, the infection returned after varying lengths of time. Our usual treatment is to give 2 doses of 15 cc., skipping the intervening milking and not milking the cow for twenty-four hours after the last injection. However, one extensively indurated quarter received 6 doses of 50 cc. at twelve-hour intervals. This quarter stayed negative for a month, but after that time developed the infection again. A cow suffering from parenchymatous mastitis due to pathogenic staphylococci developed an infection of *Corynebacterium pyogenes*. She was then treated with intramammary injections, receiving 300,000 units of penicillin: 100,000 in our usual preparation, 100,000 in aqueous solution, and 100,000 in plain peanut oil. The quarter was saved from gangrene, and the cow is now producing as much milk as usual out of the other 3 quarters. The 1 infected is completely dry, and it is doubtful if it will ever regain its function. In most of these cases, sodium penicillin (Schenley) was used (*see* table 1).

Experiment Pen 5.—Ten quarters in 7 cows were treated with a single 15-cc. dose of peanut oil with 3 per cent beeswax containing 1,000 units per cubic centimeter of sodium penicillin (Schenley). They were not milked until twenty-four hours later and then not milked again for the next twenty-four hours. In other words, they

were milked on a 24-hour instead of a 12-hour schedule for two days. Six of these quarters in 5 cows were infected with pathogenic staphylococci; 2 quarters in 1 cow were infected with *Str. agalactiae;* one quarter was infected with *Streptococcus uberis,* and one quarter was infected with a coliform organism. Only one quarter, that infected with *Str. uberis,* responded, and it is still negative after a month (*see* table 1).

Experiment Pen 6.—Retreatment of herd used in pen 3. Fifteen quarters in 10 cows were treated with 3 doses of 15 cc. each of calcium penicillin Squibb, 1,000 units per cubic centimeter of peanut oil with 3 per cent beeswax. The intervening milkings were skipped, and the cows not milked for twenty-four hours after treatment. Of the 15 quarters, 9 in 6 cows were infected with pathogenic staphylococci, 5 with *Str. uberis,* and 1 with *Str. agalactiae.* All quarters infected with pathogenic staphylococci had been previously treated with 2 doses of 15 cc. each. Seven quarters in 4 cows had not responded when examined two weeks after treatment. Of the 7 quarters that responded, only 2 were infected with a pathogenic type of staphylococci previous to treatment. Thus only 2 of 9 pathogenic staphylococci-infected quarters responded to treatment. The quarter infected with *Str. agalactiae* responded. Four of the 5 quarters infected with *Str. uberis* responded; 1 did not. All results reported in this experiment were findings two weeks after treatment (*see* table 1).

CONCLUSION

From a review of the literature and the results of our experiments, it is apparent that penicillin is a valuable addition to the therapy of bovine mastitis. The preparations containing penicillin have been found relatively nonirritating to the bovine udder and effective against either streptococcus or staphylococcus infections.

Though penicillin is not as effective against staphylococci as it is against streptococci, it is apparently more effective than any other known therapeutic agent against staphylococci.

At present, it is impossible to state the optimum dosage, but a rather high level of dosage seems indicated. The testing of a specific infection for sensitivity to penicillin is desirable in resistant cases.

Potency of Penicillin

Chas. Pfizer and Co.	2,000,000 units	949 units/mg.
Schenley Laboratories	500,000 units	277 units/mg.
	4,500,000 units	330 units/mg.
	1,000,000 units	404 units/mg.
	1,000,000 units	394 units/mg.
	2,000,000 units	370 units/mg.
E. R. Squibb & Sons	15,000,000 units	372 units/mg.

We wish to express our appreciation to the companies who supplied the penicillin.

ACKNOWLEDGMENT

The advice and assistance of Dr. Louis A. Klein, professor of Veterinary Hygiene and Pharmacology, School of Veterinary Medicine, University of Pennsylvania, was of invaluable aid to the author.

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Goat's Milk Not Anemia-Producing

Reports to the effect that goat's milk produces anemia in laboratory animals were refuted in trials carried out by workers of the U. S. Bureau of Animal Industry at Beltsville, Md. Goat's milk was found to be slightly higher in calcium, phosphorus, albumin, and nonprotein nitrogen than Holstein-Friesian milk. The iron content was 0.068 mg. and copper 0.053 per cent. Summarized (quoting), "the composition of properly produced goat's milk is similar to that of cow's (Holstein) milk."

The number of milking goats in the United States is estimated to be 1 million and the sale of goat's milk amounts to $100 million annually.

Aujeszky's Disease in Wisconsin

HARVEY H. HOYT, D.V.M.
Madison, Wisconsin

AUJESZKY'S disease, or pseudorabies, causing a heavy loss of beef cattle in Lafayette County, Wisconsin, was diagnosed in September, 1945. A report of this case is made because a review of the literature subsequent to Shope's studies, in 1930, does not indicate any report of the disease occurring in Wisconsin.

Aujeszky, in 1902, first demonstrated the active causative agent. In 1931, Shope reported on studies of a filterable virus recovered from a case of "mad itch" which occurred in Iowa, in 1930. He reached tentative conclusions that the virus was the same as that of Aujeszky's disease. Shope's studies, in 1935, on the epizoötiology of pseudorabies indicated that swine developed a mild illness following infection with the virus and probably served as a reservoir of infection for cattle. He also found that a large percentage of midwestern swine had neutralizing antibodies for the virus and that eastern swine did not.

FIELD OBSERVATIONS

This case, attended by Dr. B. L. Lawlor, of Shullsburg, Wis., occurred in a herd of 33 beef cattle on pasture. The first evidence of disease in the herd was the death of an animal known to be with the herd, and apparently healthy the previous day. During the first day, 8 more were affected. The affected animals rubbed their heads on fences and other objects, producing severe traumas. Deaths occurred suddenly. On the following morning, 4 more were sick and the remaining 20 were shipped for slaughter. Of these, 1 was condemned *ante mortem* on elevation of body temperature. It was reported that most of those slaughtered showed hemorrhages and pulmonary involvement suggestive of pasteurellosis. Four dairy heifers that had been with this group of cattle had been removed from the pasture about two weeks previous to evidence of infection. One of these heifers developed the disease and the others were immediately shipped for slaughter. None of the dairy herd kept in another pasture was infected.

A heavy population of rats existed on the premises and in the barns, but no evidence of disease was noted in them. A factor considered significant in this case was the pasturing of swine with the cattle. These swine were introduced to the farm through a dealer who had imported them into Wisconsin.

LABORATORY DIAGNOSIS AND EXPERIMENTAL INFECTION

An investigation of the case in the field could not be made; therefore, the attending veterinarian destroyed an affected animal and submitted the head to the laboratory for study. Initial isolation of the virus was made by triturating portions of the cerebrum, brain stem, cerebellum, and medulla with sand and suspending this material in 0.85 per cent saline solution in about a 25 per cent concentration. The suspension was then centrifuged at approximately 1,500 r.p.m. for about three minutes and the supernatant liquid used for inoculum. A rabbit inoculated intracranially with 0.2 cc. of this material died within forty-eight hours. After three serial passages through rabbits, the virus consistently produced death at about sixty hours. Inoculums used subsequent to the initial isolation were negative to cultural examination, but filterability of the virus was determined. Two trials with Seitz No. 2 filter discs produced noninfective filtrates. Berkefeld N filtrates of saline suspensions were avirulent, but the use of veal infusion menstruum pH 7.8 yielded an infective bacteria-free filtrate on passage through the Berkefeld N candle. The original brain material kept in 50 per cent buffered glycerin at approximately 4 C. was virulent after sixty-eight days of storage.

Bacteriologic studies of the brain submitted from the field case demonstrated gram-positive sporeforming rods from the cerebrum and cerebellum and negative cul-

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tures of the medulla. Cultures of the brain and parenchymatous organs of experimentally infected animals were consistently negative.

Rabbits inoculated intracranially died an hour or two after symptoms developed. The most pronounced symptoms were striking of the forehead, pulling the head back, and tumbling over backwards. Following subcutaneous inoculations, the incubation period was prolonged twelve to twenty-four hours. The first symptom was scratching

The site of inoculation was at the posterior point of the white on the withers on the dorsal median line. The pruritus developed on the denuded area.

at the site of the inoculation, producing a hyperemic, edematous, and denuded area, and mutilation of the skin. Death resulted in six to twelve hours after the onset of symptoms. Guinea pigs were susceptible but were not observed during the time symptoms may have been exhibited.

To obtain a complete syndrome of the infection in cattle, a 350-lb. calf was inoculated subcutaneously just posterior to the withers and slightly to the right of the dorsal median line with 5 cc. of the original inoculum prepared. Symptoms were first observed on the fifth day after inoculation. The first evidence of illness was failure to eat all of the morning feeding, soon followed by anxiety, tympanites, and a slight excitability. Three or four hours later the animal was licking the site of inoculation. The temperature taken at this time was 103.4 F. The evidence of pruritis continued to increase for the next twenty-four hours, extending down the right side to the ventral median line. Concurrent with this symptom, clonic spasms of the muscles of the forelegs, hind legs, and the flank developed. Restlessness increased and stamping of the feet was noted from six to twenty-four hours after the onset of symptoms. Some desire for water was shown during the first twenty-four hours, but difficulty in swallowing suggested a partial paralysis of the pharynx at this time. After twenty-four hours of illness, the temperature was 105.2 F.; a pronounced dyspnea had developed, and the pruritis was still evident, but licking of the area decreased, apparently due to weakness of the animal. The temperature was 102.4 F. at forty-eight hours; the animal was comatose, and had a pronounced expiratory dyspnea. Death occurred at about fifty-two hours.

NECROPSY FINDINGS

Necropsy of the rabbits infected usually showed a swelling of the subcutaneous tissue af the site of inoculation, with marked edema and some hemorrhagic exudate present. The lungs were acutely hyperemic and exhibited an interstitial edema. The epicardium consistently contained petechial hemorrhages. The bladder was always greatly distended with urine that contained flaky deposits. Except at the site of introduction of the needle, there was little gross evidence of change in the brain.

The gross pathologic changes observed on necropsy of the experimentally infected calf suggested a generalized bacterial infection and could easily be interpreted as the result of pasteurellosis. The epicardium exhibited numerous petechial and ecchymotic hemorrhages. The liver and spleen were slightly congested, bright red in color, and somewhat pulpy. The kidneys showed hyperemia of the pyramids and a few cortical hemorrhages. The bladder was distended with slightly brown colored urine. The forestomachs and abomasum showed no changes. There was an acute catarrhal enteritis with hemorrhages of the mucosa in localized areas. The skeletal lymph nodes appeared normal, but the visceral nodes showed a serous lymphadenitis. The skin over the area showing pruritis was denuded of hair and leathery in texture, and the adjacent subcutaneous tissue was edematous.

HISTOPATHOLOGY

Hurst reported a fibrinous meningitis involving the pia mater as the outstanding change in the nervous system of infected rabbits. No histologic studies were made of affected organs from rabbits used in this work. Studies were made of material from the infected calf. Sections taken from involved muscle at the site of inoculation exhibited hemorrhages of the interstitial tissue. The muscle fibers were distended, the striations were indistinct, and some of the nuclei were pyknotic. The cortex of the kidney showed distention of the capillaries and minute foci of hemorrhages into the interstitial tissue. The medulla of the kidney showed marked distention of the blood vessels and considerable hemorrhage into the interstitial tissue. The spleen was normal in cellular structure with marked hemosiderosis of the red pulp most pronounced at the periphery of the splenic corpuscles. There were subcapsular hemorrhages in the spleen. No changes were recognized in sections of the cerebrum, thalamus, cerebellum, and medulla.

SUMMARY

1) Aujeszky's disease caused a high mortality in a herd of beef cattle in Wisconsin in 1945.

2) Swine were associated with the cattle and rats were a problem in the buildings and the premises.

3) The infection was reproduced in rabbits, guinea pigs, and a calf.

4) The active agent was passed through a Berkefeld N filter.

5) The original brain material was infective after sixty-eight days of storage in 50 per cent glycerine at about 4 C.

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An Outbreak of Rabies in a Dairy Herd

On Feb. 27, 1945, I was called to see 2 animals, 1 a heifer of 20 months and the other a cow of possibly 6 years. The herdsman had reported the possibility of rabies which was prevalent in this district at the time. No symptoms were evident except that the 2 animals appeared to be "dummies." The temperature was normal and the only abnormality observed was that neither animal would take food or water. Instructions were left to report any change and to call if either animal died. On March 1, 1945, the herdsman reported that the heifer was down and that he expected her to die within a few hours.

A positive diagnosis of rabies from the State Pasteur Institute confirmed the diagnosis of rabies. The head of the second animal was not submitted for laboratory examination. The herdsman had seen his dog in the heifer lot, nipping at the legs of 15 head some time before. Nothing was thought of his apparently playful antics until the animals began coming down with rabies. The dog disappeared shortly after this observation.

On February 1, a neighbor of the dairyman submitted this dog to a laboratory for examination. A few days later a positive report of rabies was received. From the lot of 15 heifers, 13 contracted rabies and died. Symptoms of all were not alike since some of the animals lowed and bellowed and others showed sex excitation. None were vicious.

Neither treatment nor prophylactic vaccination was administered on the ground that the infection was too far advanced when the first call was made.

During this outbreak, I was called to see many cases of rabies. The symptoms in most of the cases were not typical. In 1 Hereford heifer, about 8 months old, no symptoms were evident except abnormal libido. In this case, fourteen days elapsed between the time she was first examined and death. Food and water was taken until the tenth day. A laboratory diagnosis con-

firmed the clinical diagnosis. In several cases, the only symptoms were refusal to eat and drink. Tenesmus was present in some but not in others.

Six dogs were submitted for examination from Feb. 20, 1945, to March 10, 1945. In no instance was a furious case of rabies seen. In 1 dog which lived twelve days from time it was admitted to the hospital until death, one of the symptoms was the typical dumb rabies howl. No food or water was taken during this time. Cerebral disturbance was suspected but not rabies, since the animal lived twelve days.

In my experiences, atypical cases have been as frequent as typical ones. All cases included in this report were confirmed by laboratory examination. Many suspects were not submitted for laboratory confirmation. In my opinion, many undiagnosed cases of "dummy" animals may have dumb rabies.—*J. W. McCoy, D.V.M., Paris, Texas.*

Rabies Among Foxes

Since 1940 several outbreaks of rabies have occurred among foxes in Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Maryland. In Burke County, Georgia, in 1940, many people were bitten by rabid foxes, and livestock suffered heavy losses before the outbreak was suppressed. In Clarke County, Alabama, in 1944, there was an outbreak of rabies among foxes, in the suppression of which during 3 1/2 months 1,188 foxes were taken in an area of 1,216 square miles. This density of fox population is too great for the good of the foxes or the community. During that period 15 people in the county took the Pasteur treatment, and the losses of cattle, horses, mules, hogs, and goats were heavy for that area. Suppressive measures have been necessary in other states where rabid foxes have been found. During 1944 in 12 counties and parishes of Louisiana, Mississippi, and Arkansas, in which rabies was present among foxes, 405 domestic animals, valued at $28,295, were bitten and died. Ninety-eight people were bitten and took the Pasteur treatment.— *From Circular No. 8, Fish and Wildlife Service, USDI.*

A digestible wire for hay baling would save many a cow.

A Preliminary Report on Use of Lead Arsenate for Removal of the Sheep Tapeworm, Moniezia Expansa

During the course of some experiments using phenothiazine for the control of certain nematodes in sheep, it was noted that, although the drug was effective in removing the stomach worm *Haemonchus contortus*, and the nodular worms, *Oesophagostomum radiatum*, and *Oesophagostomum columbianum*, after treatment some of the animals continued to exhibit diarrhea, emaciation, loss of weight, and pot belly. It was determined by fecal examination that there remained a very light infestation of the stomach worm and nodular worm, a moderate to high infestation of Strongyloides, and a moderate to high infestation of the tapeworm, *Moniezia expansa*. Autopsy of a number of animals verified the findings that were suggested from fecal examinations. The findings indicated that the conditions of the animals were due to either the presence of Strongyloides, or of tapeworms, or to the presence of both parasites.

So far as the writers are aware, there is no satisfactory treatment for the removal of either of these parasites. However, Radeleff, in 1945, reported excellent results with a 95 per cent spray grade of lead arsenate for removing tapeworms from sheep, goats, and cattle. Radeleff gave 0.5 Gm. of lead arsenate to kids and lambs, and 0.5 to 1.0 Gm. to calves. The drug was administered in gelatin capsules without previous fasting. He found that it was necessary to administer castor oil to the calves and adult cattle one hour after administering the lead arsenate, in order to prevent colic.

Thirteen lambs exhibiting varying degrees of diarrhea were treated. Fecal examinations showed these animals to harbor a mild infestation of stomach worms and nodular worms, and a mild to heavy infestation of tapeworms and Strongyloides. Eleven of the animals were given 0.5 Gm. each of lead arsenate in a gelatin capsule and 2 animals were given 1.0 Gm. each of the drug. Feces from each animal were collected individually for four days follow-

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ing treatment. Each animal expelled from ten to 150 chains of tapeworm segments (*Moniezia expansa*). No nematode parasites were recovered. Fecal examinations showed negative for tapeworm eggs four days after treatment and remained at that level from five to twelve weeks. Diarrhea subsided at the same time.

The animals were put back on permanent pasture one week after treatment. Eleven of these animals have not shown diarrhea eight months after treatment. It was necessary to re-treat 2 of the animals five weeks after the first treatment.

These results indicate that lead arsenate is useful in the control of tapeworms in lambs in that clinical symptoms subsided after treatment, and the animals made an uneventful recovery.—*J. W. Ward, M.S., M.A., and J. W. Scales, D.V.M., State College, Miss.*

Note on Brucellosis

It is a well established fact that the unregulated traffic in infected and exposed cattle has always been, and is today, the chief cause for the spread of brucellosis throughout the state.

The incidence of *Brucella suis* in the undulant fever cases diagnosed, and in which the causative organism was established, was 70 per cent in Iowa and 72.6 per cent in Alabama. The only epidemics of undulant fever that have been reported have been caused by swine and goat types.

The unregulated use of vaccine is incompatible with the payment of indemnities, and also provides material for the unscrupulous to make reactors of negative, but unprofitable, animals.—*From the report of the Special Committee on Brucellosis of Cattle, Illinois State Veterinary Medical Association, January, 1946.*

Hog Cholera in Canada

In speaking of hog cholera, the Veterinary Director General of Canada says in his report, "This disease was somewhat more prevalent than during the previous year. Outbreaks occurred in the provinces of Nova Scotia, New Brunswick, Ontario, and Manitoba. The most extensive outbreak occurred in Manitoba, where the disease made some headway before it was discovered. Under the policy of slaughtering all swine on infected premises, no difficulty was experienced in eradicating the disease."

Encephalomyelitis in Ecuador

The virus of equine encephalomyelitis was isolated for the first time in Ecuador on Dec. 31, 1944, by Dr. C. Gonzalo Sotomayor Navas, Guayaquil. Blood serum from a sick horse was injected intraperitoneally into a guinea pig to make the isolation.

By hyperimmunizing two sets of guinea pigs, one with virus from Ecuador and the other with virus from Venezuela, it was shown that they are antigenically the same. All of the immunized animals lived, while all of the control animals died within ninety-six hours of the time of inoculation.

Colorado tick fever and dengue appear to be distinct disease entities, says the *Journal of Experimental Medicine* (April, 1946).

Designed by Leonard P. Craske, this statue is a permanent memorial to the fishermen of Gloucester, Mass. who have lost their lives at sea.

Sulfamerazine in the Treatment of Pullorum Disease

G. W. ANDERSON, D. V. M.
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PULLORUM disease among chickens and turkeys is widespread, and its control is of great importance to poultry owners. According to an authoritative source[1], this disease is recognized as the cause of high mortality among chicks and poults, reduced fertility and hatchability, retardation in growth, reduced egg production, even increased mortality among adult birds, and a reduction in the sale of quality stock from infected flocks.

Little or no success has been obtained, heretofore, from the use of chemotherapeutic agents in the treatment of this disease. The identification of infected birds, from breeding flocks supplying eggs for hatching, by blood examination and the elimination of affected individuals is undoubtedly the best method to eradicate pullorum disease from chickens and turkeys. This is being practiced by most poultrymen. Since instances arise, however, wherein this method apparently does not solve the problem, requests are received for additional help in order to save young birds.

Recently developed sulfonamides—sulfamerazine and sulfadiazine—appear to have considerable value in the treatment of the disease in baby chicks as reported by Severens, Roberts and Card[2]. They showed that 0.5 per cent sulfamerazine or 2.0 per cent sulfadiazine fed in dry mash protected a high percentage of chicks which had been artificially infected with 24-hour broth cultures of *Salmonella pullorum*. The encouraging and favorable results reported by these workers prompted the clinical study included in this report.

MATERIALS AND METHODS

A natural or field outbreak of pullorum disease occurred in a flock of 1,000 Rhode Island Red chicks. The source of these chicks, the history relative to the incidence and severity of pullorum disease in the hens, and the conditions of incubation and handling of eggs and chicks prior to delivery to the poultry farm, are not known. The chicks were delivered to the farm as day-old birds.

During the first fourteen days after arrival, there was a mortality of 216 birds (21.6%). A number of dead chicks were brought to our laboratory for examination and diagnosis. Postmortem examination disclosed lesions of pullorum disease. This diagnosis was later substantiated by bacteriologic findings. Pure cultures of *S. pullorum* were isolated by the usual laboratory methods for identifying the organisms.

The surviving chicks were divided into two groups on the poultryman's premises. No special effort was made to clean or disinfect the brooder houses or equipment that were in use.

In group A, there were 407 birds, including, at the owner's request, all the visibly sick chicks. This group received 0.5 per cent sulfamerazine powder* in the dry mash for a period of twenty-one days. Some of the birds did not eat sufficient medicated feed during the period of treatment to maintain a satisfactory growth rate and, for this reason, were given an afternoon feeding of nonmedicated mash every third day.

In group B, there were 377 chicks and, at the time they were separated from the others, all appeared well and showed no symptoms of pullorum disease. These birds received no chemotherapeutic treatment but were kept and handled in every other way similar to those in group A. The two groups were separated for a period of six weeks. Daily mortality was recorded by the owner and the flock was inspected at weekly intervals by the writer.

Table 1 shows the number of chicks in each group, and the number and percentage that died during the periods of observation.

DISCUSSION

The data presented above indicate that the birds treated with 0.5 per cent sulfamerazine in the dry mash over a period of twenty-one days were definitely benefited. It will be noted that a rather high percentage of the chicks in group A died during the first week of treatment. We believe this to be due to the fact that all visibly sick birds were included in this group at the beginning of the study. It is quite possible also that many of these birds

Technical Contribution No. 131, South Carolina Agricultural Experiment Station, Clemson, S. Car.

*Supplied by Sharpe and Dohme.

were too ill to eat and undoubtedly received little or no medicated feed. During the second week of the experiment, however, a relatively low percentage of the birds in this group succumbed.

TABLE I.—The Effect of a 0.5 Per Cent Sulfamerazine Feed in the Treatment of Pullorum Disease.

Days	Original no. of chicks	No. dead	No. surviving	Mortality (%)
1-14	1,000	216	784	21.6

	GROUP A (Treated) (Some clinically ill on 14th day)			GROUP B (Nontreated) (All clinically well on 14th day)		
Days	No. of chicks	No. dead	Mortality (%)	No. of Chicks	No. dead	Mortality (%)
15-21	407	109	26.7	377	146	38.7
22-28	298	14	4.7	231	66	28.5
29-35	284	0	0	165	9	5.4
36-42	284	0	0	156	5	3.2
43-49	284	0	0	151	0	0
50-56	284	0	0	151	0	0

It is significant that the birds in group B showed no clinical evidence of pullorum disease at the time they were separated from group A. Birds in group B were kept under conditions similar to those in group A, but they received no chemotherapeutic treatment. The number of deaths among this group of untreated birds during the following four weeks indicates that the infection was still present. Within a few days after the chicks were separated, some showed symptoms of the disease and died.

The mortality among the birds in group B during the third and fourth week was rather high (38.7% and 28.5%, respectively). In fact, the mortality during this period was greater than during the first fourteen days after the chicks arrived on the farm. The death rate in this group during the fifth and sixth weeks was 5.4 per cent and 3.2 per cent, respectively. This is in excess of what is considered as the expected death loss among chicks of this age, unless they are influenced by the presence of some specific infection or condition.

At the end of the sixth week, the two groups were combined. No additional losses occurred subsequently, and apparently the flock was free of other serious diseases.

CONCLUSIONS

1) Under the conditions of this test, sulfamerazine was effective in reducing mortality during a natural outbreak of pullorum disease in baby chicks. Treatment was not begun until fourteen days after the onset of the disease.

2) The high mortality in group A during the first seven days of treatment (only 12% less than group B) was probably due to the fact that, at the owner's request, all visibly sick birds had been included in this group.

3) The observations recorded with respect to the mortality that occurred in the treated (group A) and control birds (group B) indicated that sulfamerazine is effective in controlling natural outbreaks of pullorum disease if an early diagnosis is established and if treatment is provided promptly.

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Penicillin sodium is of some definite value in the treatment of infectious cystitis and pyelonephritis, although actual cures can not be assured. (*Vet. Ext. Quar. No. 100, U. of Penn.*)

The kind of fat consumed affects the vitamin synthesizing bacteria in the digestive tract, and through them, growth, says E. B. Hart, Wisconsin. Butterfat, in combination with most carbohydrate foods, encourages growth of the bacteria which synthesize vitamin B.—*Nat. Dairy Council, December, 1945.*

Leucocytic Changes in the Bovine Animal Eighteen Hours After the Subcutaneous Injection of Tuberculin

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SINCE Uskoff[1] reported a leucocytosis in tuberculous human beings following the subcutaneous injection of tuberculin, similar leucocytic changes have been reported in tuberculous cattle following the subcutaneous injection of tuberculin. This increase in leucocytes in tuberculous human and bovine patients involves mainly the polymorphonuclear cells, with or without a shift to the left according to the Schilling index[2], and a coincidental decrease in lymphocytes.[3,4,5]

The investigation described herein was undertaken in an attempt to correlate leucocytic changes in tuberculous cattle following the subcutaneous injection of tuberculin with the presence of tuberculosis. Such leucocytic changes, if encountered, might be regarded as an adjunct to the tuberculin test in the diagnosis of bovine tuberculosis. During the course of the investigation, total and differential leucocytic counts were made on 15 cattle in tuberculosis-free accredited and 84 cattle in infected herds.

MATERIALS AND METHODS

Five cubic centimeters of blood were drawn from the jugular veins of cattle by means of a California type bleeding needle and holder into small glass vials containing approximately 0.001 gm. of potassium oxalate. (The samples were collected immediately before and eighteen hours after the subcutaneous injection of tuberculin.) All total leucocyte counts were made within twenty-four hours following the collection of blood. Dilutions for total leucocyte counts were made in Thoma type pipettes, using 2 per cent oxalic acid to make a 1 : 200 dilution. All total leucocyte counts were made on counting chambers with improved Neubauer ruling.[6] Blood films for differential leucocyte counts were prepared on 1 by 3-in. glass microslides and fixed in absolute methyl alcohol for five minutes. Giemsa's stain was used throughout for staining differential preparations.[7]

All tuberculin used for testing cattle was prepared by the Bureau of Animal Industry, United States Department of Agriculture. The dosage of tuberculin injected subcutaneously varied from 5 to 30 cc. Autopsies were conducted by veterinarians employed in the Meat Inspection Division, United States Department of Agriculture. Representative tissue lesions were collected by the inspector in charge, identified, and packed in boxes with solid carbon dioxide as a refrigerant for transportation to the university laboratory.

BACTERIOLOGIC EXAMINATION AND ANIMAL INOCULATION

Each lesion was cultured on blood agar and nutrient agar plates. Composite samples from the representative lesions from each animal were finely ground with sterile sand and 0.85 per cent sodium chloride solution in sterile mortars and strained through sterile gauze.[8] This material was placed in sterile flasks with an equal quantity of sterile 5 per cent oxalic acid solution. Following incubation at 37.5 C. for thirty minutes, 10 cc. of the tissue suspension was transferred to centrifuge tubes and centrifugalized at 2,800 r.p.m. for thirty minutes in a centrifuge with a distance of 8 in. from the center of the rotor head to the bottom of the centrifuge cup. The supernatant fluid was then discarded and a loopful of the sediment at the bottom of the tube was taken for inoculating three tubes of egg yolk agar medium. A smear for acidfast staining was made at this time. Egg yolk agar medium was employed in culturing tissue lesions for the recovery of the tubercle bacillus.[9] This medium was prepared as follows:

Meat extract	6 Gm.
Peptone	10 Gm.
Sodium chloride	5 Gm.
Distilled water	1,000 cc.
Agar	20 Gm.

These ingredients were boiled together for fifteen minutes; sufficient water was added to restore the original volume, and filtered by suction through absorbent cotton in a Buechner funnel. After adjusting the pH to 7.2, it was dispensed in 300-cc. quantities in 500-cc. Flor-

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ence flasks and sterilized at 15-lb. pressure for thirty minutes. The flasks were then stored in an ice box. To complete the final culture, medium fresh eggs were immersed in 75 per cent alcohol for 15 minutes and air dried. Sterile forceps were used to break the eggshell. The albumen was discarded and the yolk dropped into a flask of agar, which had been previously melted in a water bath and cooled to prevent coagulation of the egg yolk. Two yolks were added to 300 cc. of nutrient agar and agitated to produce a homogeneous medium. The completed medium was dispensed to 6 by 7/8-in. pyrex test tubes and allowed to harden in a slanting position. The medium was not resterilized. All slants were incubated seventy-two hours at 37.5 C. to expose contaminants. Three tubes of egg yolk agar mediums were inoculated from each composite tissue lesion. The inoculated tubes were sealed with paraffin, and incubated at 37.5 C. and examined at intervals over a period of twelve weeks.

The sediment remaining in the centrifuge tube after inoculating the egg yolk agar slants was resuspended in 5 cc. of 0.85 per cent sodium chloride solution. One cubic centimeter of this suspension was injected subcutaneously into the abdominal wall of each of 2 guinea pigs.

RESULTS

Twenty-four of 25 cattle which gave positive tuberculin reactions showed marked alterations in the leucocytic formula, consisting of an increase in number of neutrophiles, with or without a shift to the left according to the Schilling index, and a decrease in the number of lymphocytes following the subcutaneous injection of tuberculin, and revealed lesions of tuberculosis on postmortem examination. *Mycobacterium tuberculosis* was demonstrated by cultural or animal inoculation methods from 21 of these cattle and not demonstrated from 1 animal. Lesions from 1 tuberculin positive animal which did not show an appreciable alteration in the leucocytic picture following the subcutaneous injection of tuberculin yielded *M. tuberculosis* on bacteriologic examination. Lesions from 2 of the 25 tuberculin positive animals were declared tuberculous by the inspecting veterinarian but were not available for laboratory examination.

Of the 99 cattle subjected to pre- and post-tuberculin injection blood studies involved in the investigation, 14 negative to the tuberculin test showed alterations in the leucocytic picture, consisting of a marked increase in neutrophiles, with or without a shift to the left, and a decrease in lymphocytes following the subcutaneous injection of tuberculin. These leucocytic changes in tuberculin negative cattle were indistinguishable, by the method employed, from leucocytic changes observed in tuberculin positive cattle following the subcutaneous injection of tuberculin.

Six of these 14 cattle were sacrificed for postmortem examination. At autopsy, all revealed localized nontuberculous pyogenic lesions. Laboratory examination of lesions from 4 of these animals yielded: (1) a (*Corynebacterium pyogenes*-like microörganism from multiple liver abscesses; (2) a *Corynebacterium pyogenes*-like microörganism from a subperitoneal abscess; (3) a staphylococcus from a tendovaginitis; (4) a granulomatous skin lesion of undetermined etiology. The livers of the other 2 animals presented multiple abscesses which were declared nontuberculous by the inspecting veterinarian but were not available for laboratory examination.

DISCUSSION

At least three possibilities are suggested in explaining the increase in neutrophiles and decrease in lymphocytes in apparently nontuberculous cattle following the subcutaneous injection of tuberculin, viz., (1) an undiscovered tuberculosis infection, (2) an antigenic relationship between Mycobacterium and Corynebacterium and (3) stimulation of leucocytic production by the tuberculin protein acting as a foreign protein. In support of the latter possibility, Gay and associates[10] state that the introduction of a foreign protein produces a reaction in normal individuals, but that the reaction is more marked in those that are already suffering from a localized or generalized infection. The polymorphonuclear leucocytes first decrease in the peripheral circulation and then rise, in some cases reaching as high as 40,000 per cubic millimeter of blood.

SUMMARY

The hematologic changes observed in 99 cattle eighteen hours after the subcutaneous injection of tuberculin are summarized as follows:

1) No significant leucocytic change was observed in 15 apparently healthy cattle in an accredited tuberculosis-free herd following the subcutaneous injection of tuber-

culin. None of these cattle reacted to the tuberculin test.

2) A marked alteration of the neutrophile-lymphocyte ratio consisting of an increase in neutrophiles and decrease in lymphocytes was observed following the subcutaneous injection of tuberculin into 24 reacting cattle. Tuberculosis infection was confirmed by autopsy, microscopic examination, animal inoculation, and cultural methods in these 24 reacting animals.

3) One animal positive to the intradermic tuberculin test and yielding *Mycobacterium tuberculosis* on culture of lesions failed to show appreciable leucocytic changes following the subcutaneous injection of tuberculin.

4) Changes in the neutrophile-lymphocyte ratio, indistinguishable from the changes observed in tuberculous cattle following the subcutaneous injection of tuberculin, were observed in 4 nonreacting cattle following the subcutaneous injection of tuberculin. At autopsy, these 4 animals revealed nontuberculous pyogenic lesions as established by bacteriologic examination and animal inoculation.

5) Similar changes in the neutrophile-lymphocyte ratio were observed in 2 other nonreacting animals following the subcutaneous injection of tuberculin. At autopsy, these animals revealed pyogenic abscesses in the liver, which were believed to be nontuberculous by the veterinary inspector. These lesions were not available for laboratory study.

6) The preliminary observations reported herein, although inconclusive, suggest that the alterations in the neutrophile-lymphocyte ratio following the subcutaneous injection of tuberculin may not be specific.

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Leptospirosis—Canine-Human Relationship

Uncertainties, errors, and whimsical ideas about the interchange of Leptospira are coming to light. In general, the authors have been in agreement as to the dog's susceptibility to both *L. icterohemorrhagiae*, the specific agent of human leptospirosis (Weil's disease) and *L. canicola* of canine typhus (Stuttgart disease), but they have disagreed as to the precise relationships of these icteric infections. In human cases, bacteriologists have agreed that *L. icterohemorrhagiae* is the cause, but concede that *L. canicola* may also be isolated therefrom. It now comes to pass that the same order applies to dogs. From the etiologic point of view, host specificity may therefore be ignored; that is to say, from the clinician's viewpoint, there is but one leptospirosis. Notwithstanding the clinical difference between the icteric and the hemorrhagic canine cases (typhus), the important fact in veterinary medicine is that the infection is interchangeable between dog and man. Ample evidence has been disclosed by critical investigations to remove the confusion. Weil's disease, Stuttgart disease, canine typhus, infectious icterus, and spirochetosis icterohemorrhagica are so many names to discard in veterinary literature, at least.

According to controlled experiments conducted at the University of Kentucky, lice preferred the White Leghorn to the Rhode Island Red. Similar experimental infestations in both breeds yielded an average of 122.6 lice on the white-feathered birds to 37.7 lice on the dark-feathered ones. In other trials, the difference was even greater.

NUTRITION

Urinary Calculi

Dr. F. G. Harbaugh, of Lubbock, Texas, discussed the incidence of urinary calculi in lambs at the annual meeting of the Texas Veterinary Medical Association in January, 1946.

In a study of cases encountered under normal feeding conditions, it was learned that the calculi are composed of tricalcium phosphate. In normal urine, there is equilibrium between dissolved and ionized calcium and phosphorus as well as between the phosphate in the urine and that in the blood. It is only when an excess is present that some is precipitated.

When the vitamin A content of the ration is low there is desquamation of the epithelial mucosa in the kidneys, ureters, and bladder; and it is believed that these shed particles may act as nuclei for the deposit of the excessive amounts of tricalcium phosphate present.

Reasoning on the basis that the addition of ammonium chloride to the ration makes the urine more acid, and that an acid urine tends to produce calcium phosphate ($Ca(HPO)_4$) rather than tricalcium phosphate ($Ca_3(PO_4)_2$), medication along this line was attempted. The following three case reports are presented for consideration rather than as conclusive proof of the value of the treatment. There was a tendency for these animals to keep going long enough so that they could be marketed.

1) *Wether Feeder Lamb, Lot 5.*—This lamb was on feed fifty-five days, from Nov. 10, 1937, to Jan. 4, 1938.

Ration: milo chop, cottonseed meal, cottonseed hulls, alfalfa (0.5 lb.), salt, ground oyster shell (0.4 oz.).

Symptoms: respirations increased; swollen abdomen, with the content giving a splashing sound of liquid on palpation. Hair at end of sheath encrusted with what resembled salt crystals; urine dribbling continually; off feed.

Diagnosis: cystic calculi.

Treatment Jan. 4, 1938: ammonium chloride, 2 drams b.i.d.; Jan. 5: same treatment; animal eating a little, swelling reduced, less dribbling of urine. Jan. 6: same treatment. By evening the animal was on feed and apparently normal.

Feb. 23, 1938: Sent to market.

2) *Wether Feeder Lamb, Lot 6.*—This lamb was on feed sixty-nine days, from Nov. 10, 1937, to Jan. 18, 1938.

Ration: milo chop, cottonseed meal, cottonseed hulls, salt, pulverized oyster shell (0.4 oz.).

Symptoms: respirations increased; swollen abdomen; salt crystals on hair of sheath; urine dribbling; down unless forced to rise.

Diagnosis: cystic calculi.

Treatment: ammonium chloride, 2 drams b.i.d. for two days.

Jan. 19 and 20, 1938: No change.

Jan. 21, 1938: Much weaker, down most of time.

Jan. 22, 1938: Died during the night.

Postmortem: bladder ruptured; abdominal cavity contained 2 gal. liquid tinged with blood, odor of urine; bladder size of walnut, ruptured on greater curvature; believed to have ruptured about time treatment was begun.

3) *Wether Feeder Lamb, Lot 6.*—This lamb was on feed 101 days, from Nov. 10, 1937, to Feb. 19, 1938.

Ration: same as for case 2.

Symptoms: respirations increased; lamb stood humped up, straining, dribbling urine.

Diagnosis: cystic calculi.

Treatment: ammonium chloride, 2 drams b.i.d. in 1.5 oz. water for three days.

Feb. 20, 1938: not straining as much; urine flowing faster than a dribble.

Feb. 21, 1938: no straining or dribbling of urine; lamb eating again.

Feb. 22, 1938: little sluggish but eating some; looks almost normal.

Feb. 23, 1938: sent to market; carcass

condemned there, but had improved clinically.

Dr. I. E. Newsom, of Fort Collins, Colo., reporting (*Tech. Bull.* 31, Colorado A. & M. College) on feeding trials, suggests that a ration composed of cane fodder and brown and white corn will be more likely to produce urinary calculi (gravel) in lambs than a ration containing alfalfa or beet tops and yellow corn. These trials also suggested that calculi may develop in the presence of adequate amounts of alfalfa when excessive amounts of calcium and magnesium carbonate are fed as a mineral supplement.

Practitioners report that sodium acid phosphate is the standard range treatment for dribblers, because it changes the pH of the urine, stops enlargement or causes regression of the calculi, and permits marketing of the animal without serious dockage or condemnation.

Future Feed Problems

Complimenting the stock-feed industry for "keeping feeds flowing to the herds and flocks of this country during the wartime crisis," Dr. R. M. Bethke (*The Feed Bag*, Dec. 1945) writes that "tough going and headaches still prevail" but draws a brighter picture from the lessons which the animal nutritionists and livestock farmers have learned about the feeding of animals without following the fixed notions of the past. The wartime emergency has taught farmers that it pays to provide complete rations to livestock and poultry and it has shown the people that the farmer will "really produce if he gets a good price for his products." There you have in a nutshell all of the science and the philosophy involved in the provision business. *It must be done right and it has to pay.* There is no alternative to that general idea. As the JOURNAL has always said, science and economics have to team up to go places, and thanks for Bethke's lift.

The author goes on to point out (and how true it is) that corn, the handy grain of our Middlewest, is not indispensable. "If that is heresy," he emphasizes, "it is still fact." What of wheat and barley and oats and sorghum? Moreover, the feed industry is reminded that milk is not indispensable in the feeding of poultry, good as it is, provided the same components that milk provides are fed to the feathered flocks. In regard to animal proteins for swine and chickens, they are indispensable only within stated limits—for the young in the absence of greens, and that applies also in the production of milk where hay and other roughages play an important rôle. Reduced to the common denominator, the feed industry is advised to supply different feeds for the manifestly different purposes: the young, the pastured, the drylot fed, the pregnant, and the lactating animal. Thus, as the research nutritionist paves the way, the commercial feed industry and the farmer who feeds his own products must follow to fulfill his obligation.

Grass Silage

Grass silage should be made from a legume (alfalfa) that has been wilted to 60 to 68 per cent moisture. On a good drying day, this will usually take about two hours. Although this wilting process means a loss of vitamin A, the carotene content still remains two or three times as high as in hay. On humid, cloudy, and rainy days the wilting takes longer, but the proper degree of moisture can be recognized by twisting a stem or two. At the proper time for ensiling, this twisting will bring moisture to the surface, but no free moisture will run off. The wilted alfalfa will appear somewhat lighter in color than when freshly cut, and the leaves and stem will be limp, but not dry and curled. A simple moisture tester is described and illustrated in USDA leaflet 238, entitled "Making Grass Silage by the Wilting Method."

When a single grain makes up the bulk of a chick's ration, the plumage is often inferior; and corn is more often responsible than wheat or oats, says *Poultry Science* (January, 1946). Several factors may be the cause of poor plumage, and they may act alone or in combination. Among those recognized are: low protein rations, vitamin deficiency, excess of crude fibre, and excess of fat.

In the search for the cause of sterility in cows, the ration should be included in the investigation. Of a sizable group of sterile cows treated only by feeding a standard ration at the New York Agricultural Experiment Station, 50 per cent conceived within six months and carried their calves to term.

EDITORIAL

The AVMA Way of Thinking

Going back to Boston for the twenty-third time in eighty-three years, but the first in fifty-four, brings to mind that the AVMA way of thinking flares from the thoughts of five generations, counting the founding generation and the one now at the helm. There is a lot of comfort in the thought that here is an organization that has never cringed before opposition, never faltered before an erg, never left its feet on slipperiest ground, never worked too rapidly to avoid major pitfalls, never forsook public interest for personal gain. These in a nutshell are its foundation and keystone.

The reflection brings to mind also that the AVMA was actually born ninety-two years ago, having been founded at Philadelphia in 1854 under the corporate name of American Veterinary Association, and that it never has been a cohort of volunteers bent on the enforcement of self-made codes designed solely to provide personal advantages, but planned to shape the destiny of an unborn profession in the public interest. A large agricultural country was being born too, so the assemblage soon delegated itself to watch over the health of the country's livestock which, through the years, became the nation's asset No. 1.

Thanks to wise council and leadership, the AVMA has weathered storms from without and quarrels from within but has never been severely endangered by schismatic movements that the characteristic common sense of veterinarians has not cured. Dismayed over internal strife or disappointed on account of slow progress dissidents, determined to start a competing national society, wisely surrendered to appeasement.

In panic and prosperity, in peace and in war, the strength of the AVMA has been based upon the sense of security that its way of thinking provided for its members and, through them, upon the stellar rôle it has played in the development of the livestock industry.

The breadth of veterinary medicine, its prodigious task, and the complexity of its management make up a protean picture so generally misunderstood that both its mechanism and its ways have to be underlined from time to time for the edification of our own circle in order to maintain the power and prestige of the integrated unit and the morale of its personnel.

An opportune moment to refresh the mind on the annals of its enduring life is the dawn of a meeting in Boston, the cradle of our democracy and the home of nine AVMA presidents, the first one in 1865 and the last in 1941, all instrumental in shaping "The AVMA way of thinking."

Improve and Expand

The present great demand for veterinary education has raised the question whether or not the profession is likely to become overcrowded. I believe that not only is there no danger of overcrowding but also that in order to perform the maximum function, the veterinary profession will have to improve and expand.— *Dean R. S. Sugg in the Auburn Veterinarian.*

Basing the conclusion on the present and future livestock values in ten southern states, Dean Sugg estimates that Alabama Polytechnic Institute will have to graduate an average of 70 veterinarians annually; besides, he points to fields of veterinary medicine for which there are no qualified men available, and to more and more work falling into the hands of laymen. Quoting: "As long as there is an inadequate number of veterinarians, we may expect more encroachments into the veterinary field."

U. S. A. Dogdom Getting Fenced In

Official documents arriving from the Dominion of Canada, the longtime restriction against dogs imposed by Great Britain, and the recent ruling of the government of South Africa against the importation of American dogs ought to be signals for our growing dog-breeding industry to heed—signals that stalling against a commonsense program for the extermination of rabies, on the sentimental ground that the species *canis* is too near the borderline of the immortal creatures of the earth to be classed as livestock, has gone on too long. The attitude of dogdom toward rabies (obstructing its eradication) is the familiar pattern with which our livestock sanitarians have had to deal before. So, as on all past occasions, means will have to be found to convince the good folk of the canine circle that compromising with disease does not help the individual proprietor/proprietress, their industry, nor the popularity of dogs and that, certainly, being what it is, rabies is a disease the people may take a notion to manhandle.

Not so long ago, as such things are computed, animal industry in the U. S. A. found itself in a position similar to that now facing dog breeders and owners, and for one reason and one reason only: Foreign countries barred the importation of our food animals and their products on account of disease hazards. Something had to be done. So, the Bureau of Animal Industry was established and the veterinary service of this country started on its long record of accomplishments in livestock sanitation and disease control. Right then our animal industry also began to mount.

Americans don't like to be fenced in and, if dog fanciers find themselves thus restricted today because of rabies, "the scientific facts necessary [for concerted action on control] are known." The report of the Subcommittee on Rabies of the National Research Council, published in the May JOURNAL, contains them.

Attention is invited to a clinical note touching upon the high incidence of rabies in farm animals in regions where the disease is prevalent in dogs. J. W. McCoy, D.V.M., Paris, Texas, in a report on "An Outbreak of Rabies in a Dairy Herd" (*see* Clinical Data) furnishes food for thought not only in that respect but also in regard to atypical cases which are not diagnosed.

Grosse Isle Rinderpest Investigation

The secret research carried out on isolated Grosse Isle (located at the mouth of the St. Lawrence), which is described in full in Part 2 of the April issue of the *American Journal of Veterinary Research*, is, by and large, the most significant veterinary event of World War II. The project was sponsored by the Secretary of War of the United States and the Canadian Minister of National Defense, who appointed a joint commission of the two countries to plan and supervise the undertaking, the purpose of which was the protection of the Western Hemisphere against rinderpest, the most formidable of cattle plagues and one of the oldest.

The members of the commission were: Brig. General R. A. Kelser, V.C., U. S. Army; Dr. C. A. Mitchell, Animal Diseases Research Institute, Canadian Department of Agriculture; Dr. Harry W. Schoening, Pathological Division, U. S. Bureau of Animal Industry; Dr. R. E. Dyer, U. S. Public Health Service; Dr. J. Craigie, University of Toronto; Dr. E. B. Fred, University of Wisconsin; Prof. E. G. D. Murray, McGill University; and Dr. G. B. Reed, Queen's University.

The laboratory workers on the research were: Captains J. A. Baker, H. K. Cooper, Dubois L. Jenkins, and Thomas O. Robey of the Veterinary Corps, U. S. Army, and Henry Griffiths of the Canadian Army; Majors R. V. L. Walker of the Canadian Armored Corps, and Fred D. Maurer of the U. S. Army Veterinary Corps, Lt. Col. M. W. Hale, V.C., U. S. Army, and Commander Richard E. Shope of the Medical Corps of the U. S. Navy.

About a year before the end of hostilities the commission reported: mission accomplished. Using chicken embryos, an improved rinderpest vaccine, more potent and cheaper than the one General Kelser and coworkers had developed in the Philippines in the 1920's, was produced. Already a million doses have been turned over to the UNRRA for use in China as soon as personnel is available.

CURRENT LITERATURE

ABSTRACTS

Infertility in a Dairy Herd

In a herd of Holstein-Friesian cattle, vaccinated with *Brucella abortus* vaccine, the incidence of infertility was high, but abortions were negligible or unobserved. The herd was heavily infected with tuberculosis.

Trichomonas foetus infection was diagnosed, and some of the animals were treated while others were not. Pyometra cases failed to respond to irrigation of the uterus, but did improve following the injection of stilbestrol diproprionate and then of posterior pituitary extract. The great majority of the cows in the herd subsequently conceived, but artificial insemination was used to avoid the spread of the infection. Semen was collected from a clean bull for most of this work, but semen from a carrier bull was used on 17 cows, only 1 of which became infected. [Previous history as to exposure to infection is not given in the abstract.] Of 8 cows destroyed as sterile, 2 showed no recognizable reason for sterility, 2 carried tuberculous infection in the genital tract, 3 suffered from ovaro-bursal adhesions, and 1 had developed a gross cystadenoma of the right ovary.

Attempts to correct anestrum by injection of pregnant mare serum were unsuccessful.—[*J. G. Wright and G. H. Arthur: Observations on Infertility in a Dairy Herd, with Special Reference to Trichomonas Foetus Infection. J. Comp. Path. and Therap., abstracted in Vet. Rec., 58, (April 13, 1946): 171.*]

Penicillin in Mastitis

Streptococcus agalactiae infection of the bovine udder may be resistant to penicillin when given in a unitage and frequency sufficient to produce a reasonable level of inhibition. No penicillin resistant strains were encountered.

Acute mastitis, when due to *Staphylococcus aureus* or to *Corynebacterium pyogenes*, shows no more than a moderate clinical improvement when treated with penicillin, unless the treatment is commenced immediately after the infection is established. With immediate treatment, the results may be highly satisfactory. The best results are obtained when an inhibitory level of penicillin is maintained for three consecutive days.

There is evidence to show that *Str. agalactiae* is more resistant to penicillin in acute flare-ups of mastitis than when the organism is present in the udder unaccompanied by any clinical manifestations of the disease.

Information to suport the conclusions is contained in tables.—[*F. W. Schofield: Penicillin in Bovine Mastitis. Canad. J. Comp. Med. and Vet. Sci. March, 1946.*]

Newcastle Disease

A description of the disease, with a detailed enumeration of symptoms shown and of the postmorten findings most likely to be observed; also an outline for making a differential diagnosis between this condition and fowl cholera or fowl pest, and a plan for instituting eradication procedures which are important in view of the lack of a satisfactory treatment.—[*E. L. Stubbs: Newcastle Disease. Univ. of Pennsylvania, Vet. Extension Quart. No. 100, Oct. 16, 1945.*]

Handling Feed Complaints

Less than 1 per cent of all feed samples analyzed after they have been suspected of poisoning poultry or livestock actually do contain enough poisonous material to be at fault, according to the information tabulated from questionnaires sent to state laboratories all over the country by the American Feed Manufacturers Association a number of years ago. This would indicate that in cases of complaints one should always obtain a number of sick poultry as well as a sample of feed. "If there is a veterinarian in the community who is interested in poultry diseases and parasites, the case may be referred to him for diagnosis."

"The practicing veterinarians can be of great assistance to the feed salesmen, and *vice versa*, and their attitude toward feed men will usually depend upon their contacts with field representatives. A whole book could be written on this subject, but some of the more common causes of friction are fairly simple." Overstepping into the other field is listed as the most common fault, the feed salesman enlarging on his knowledge of disease and the veteri-

narian assuming knowledge of nutrition based on information which is incomplete or outdated.

Under the heading of "Recommending Treatment," this statement appears: "A correct diagnosis is always necessary before any treatment is instituted. That is just plain common sense. One cannot intelligently recommend any treatment until the cause of trouble is known."—[*Lyman Peck: Handling Feed Complaints. The American Miller, March, 1946.*]

Anatomy in the Study of Medicine

Since the time and effort devoted to the study of anatomy in the veterinary colleges in this country has become a debatable question, this documentation of the subject is opportune. Playing around with anatomy has become a pastime of both thoughtful and thoughtless critics of that branch of learning. In short, anatomy in the veterinary curriculum faces a debunking that must seem discouraging to the faithful teacher of a science once regarded as the real and only basis of sound medical erudition, ignorance of which can leave the most brilliant medical mind groping for a little fact he ought to know. At best, a medical course is but the opportunity for self-education but even that start cannot be achieved without building up from this allegedly lowly branch of the curriculum. As these columns have already told, for the course of anatomy to be of maximum interest and educational value, the functional and clinical importance of structures (within reason) should be taken along with descriptions and relations. This book does just that, but being exclusively human the only excuse for its review here is the dogmatism it aims to discard in the teaching of anatomy.—[*Anatomy as a Basis of Medical and Dental Practice. By Donald Mainland. 881 pages. Illustrated. Paul B. Hoeber, New York. 1945. Price $8.50.*]

Undulant Fever

Under the title "The Great Masquerader," there is presented a variety of factual information quoted from interviews with research workers at several laboratories. The reader learns that undulant fever in human beings can usually be traced to a source in animals; that in the Middlewest the swine organism (*Brucella suis*) is responsible for more cases than the bovine organism (*Brucella abortus*), and that direct contact with infected animals is more dangerous than contact with the products of these animals.—[*Bill Renshaw: The Great Masquerader. Prairie Farmer, Nov. 10, 1945.*]

BOOKS AND REPORTS

National Academy of Sciences, Report of 1943-1944

Wartime restrictions prevented the publication of this report in 1945. The importance and extent of the many ramifications of its working unit—the National Research Council—obviously had to yield to the allocation of newsprint for the newspapers and the thrillers of the magazines.

In our horizon, the Academy, like the AVMA, was a child of the War between the States. Its corporate charter, granted by Congress, was approved by President Abraham Lincoln March 3, 1863. The clause restricting the membership to fifty was amended July 14, 1870, "to remove the limitation of the number of ordinary members." On June 20, 1884, an amendment authorized the corporation "to receive bequests and donations to hold in trust" and apply "by the said Academy to aid in scientific investigation." A third amendment, approved by President Woodrow Wilson May 27, 1914, authorized a freer handling of its trust fund.

The report is a summary of activities for the year ending June 30, 1944, with interpolations of events of 1945, a list of members, treasury report showing a financial solidarity running into seven figures, and a transcript of its constitution and by-laws. If not lively reading material, it is a factual statement of the *status quo* from which the wise reader can draw his own conclusions and write his own *critique* about just what has been making this country tick so well all these years of articulated development: scientifically, educationally, agriculturally, industrially, and defensively, when survival is endangered by the hazards of war or the stupidities of peace. The serenely contented masses who believe that federal interest in science began with the atomic bomb must now be as astonished at the longevity of the "American academy of science" and the scope of its work through the years, as the sense of security revealed by the remarkable ramparts scientists had erected for the operations of the armed forces in the nation's greatest struggle for survival. The boastful scientists of a mighty foe were no match for them.

Regrettably, in our own circle, the National Research Council was barely known to exist until physical scientists became the vogue during the prosecution of the war, notwithstanding the discipline of its committees on animal health, animal nutrition, and foods which plan and prop the bases of our undertaking. Perhaps science itself is not without blame, having lived in a "shell of exclusion" in a sea of dignity instead of floating up to the surface where it

can be seen and have its picture taken.—*Report of the Academy of Sciences—National Research Council—Fiscal Year, 1943-1944. 154 pages. Paper. Superintendent of Documents, Government Printing Office. Price 30 cents.*

Report of the Veterinary Director General of Canada

"The health of Canadian livestock continues on a high level" is a familiar prelude to this annual report—an annual disappointment to statisticians looking for pathologic tragedies, for they find Canada going right on being a safe place to raise farm animals, with a disciplined veterinary service charged with that responsibility. The grave threats to livestock range from none to modicum, meat inspection expanding, tuberculosis eradication on the way, hog cholera kept from flaring, and 2,719 herds under the supervision of the Health of Animals Division. The 63 cases of rabies in southwestern Ontario might be a penalty of the "good neighbor policy." Disease is not a respecter of unguarded international boundaries. The incidence of bovine tuberculosis is low. It is handled by two plans: accredited herd and area testing. Canada being what it is geographically, agriculturally, industrially, and highly diversified in density of population, the tabulated facts about the incidence of animal diseases contain ecologic studies of considerable importance.—[*Report of Veterinary Director General M. Barker, V.S., for the year ending March 31, 1945. 37-page booklet. Public document, Ottawa, Ont.*]

Annual Report, British Columbia Department of Agriculture

The annual report of Minister of Agriculture K. C. MacDonald to his Honor W. C. Woodward, Lieutenant Governor, for the year 1944 gives a general view of farming in that northwestern nook of the American continent: crops, products, marketing, and pestology of plants and animals, presented in the form of descriptive material, tables, and illustrations. A somewhat startling feature are the two pages given over to an investigation of a proprietary, hypodermic therapy (called the Koch treatment) for "acute infectious mastitis and related diseases of cattle," which appears to have been forced upon the Department by dairymen and the manufacturers of the phenomenal drug, identified in the report as "glyoxilide," 5 cc. of which brought down the bacterial count of one cow's milk from 25,000,000 to 95,000 and of 29 other cows to a remarkable but lesser degree. The trial was conducted by a veterinarian chosen by the Department and another representing the manufacturer. It is unfortunate that such graphic figures are given room in an official report in the absence of details as to "Materials and Methods," for the reason that the alleged cure for "mastitis and allied disease of cattle" is made to appear tremendous. Moreover, a drug of that power shouldn't be kept hidden in an official document of limited circulation in a world so disquieted over the bacterial count of milk. "Most of the veterinarians appeared to be hostile to the Koch treatment" the report admits. More courage to them.

[Dr. Koch is now on trail in a criminal case brought by the federal Food and Drug Administration, in the Federal District Court in Detroit, Mich., in connection with the sale of his remedy which he claims will cure cancer, heart disease, diabetes, and allergies in man, and brucellosis, mastitis, sterility, nasal catarrh, and ketosis in cattle.—ED.]

The Province has 85,501 cattle, 17,880 calves, 191,484 hogs, 115,748 sheep, a sizable equine population (as of 1944), and is known to the world's veterinary circle as the site of many an important scientific research of great value to animal husbandry and veterinary science. Chief Veterinarian Anson Knight, in his account of prevailing livestock diseases, shows that the British Columbia farmer is in safe hands. As in all other parts of the continent, brucellosis and mastitis remain the unsolved problems.

Dairy Commissioner Henry Rive points out that, while the period (wartime) has not been ideal for dairy production, butter factories, creameries, and cheese factories have been added and herd-improvement continued in the face of droughts, rains, insects, and labor and feed shortage.

Poultry Commissioner J. R. Perry confirms the remarkable food-producing capacity of chickens in pointing out that, in 1943, production got ahead of consumption and overwhelmed the ability to handle the surplus, a state comparable to that staged by the poultrymen of the United States during that year. The Commissioner signalizes the Kentucky Whites, the compact, bantam breed of 8-lb. hens and 10-lb. gobblers, as a promising turkey for the small family.

With the mind on British Columbia, one cannot escape mention of the work of Seymour Hadwin on the life ring of the heel fly (warbles) of which one is reminded in this report by efforts at mass extermination. In 15 districts where cattle had been treated for warbles for seven consecutive years, 1,694 head were found to be harboring only fifty-one warbles.—[*Province of British Columbia, Thirty-Ninth Annual Report of the Department of Agriculture for the Year 1944. Edited by J. B. Munro, M.S.A., Deputy Minister. 176 pages. Illustrated. Paper bound. Charles F. Banfield, printer to the King's Most Excellent Majesty, Victoria, B. C. 1944.*]

THE NEWS

Boston — Fifty-four Years Ago

The city which is host to the Association's annual meeting this year revives memories of an earlier, historic AVMA session in the same spot fifty-four years ago. The town is Boston, the cradle of American independence, located on the upper end of the Old Post Road in the State of Massachusetts, custodian of Plymouth Rock and of the "sacred cod." The cradle was rocked by John Hancock, Sam Adams, and Paul Revere, early educationists, colorful scribes, topmost surgeons, and practical anesthetists. It's the home of the Red Sox and Boston Braves, John L. Sullivan, Henry Cabot Lodge, Mary Baker Eddy, and Charles W. Eliot, named to eschew class partiality.

The task of writing of Boston would be thrilling were one able to rise to the occasion. In our own corral, there is much to say. The AVMA's 22 meetings in Boston and its nine Massachusetts presidents, against New York's 13, Pennsylvania's 6, District of Columbia's 5, Ohio's 3, and 2 each for such important geoponic territory as Illinois, Minnesota, Missouri, New Jersey, Colorado, Iowa, and Canada, are truly a good record, considering population and acreage. There are also two treasurers and a long list of executives and committee workers inscribed on the records. These presents ought to furnish material for quite an essay without even bringing up George Dadd's veterinary school and magazine in the 1850's, Thayer's single-handed mastery of bovine contagious pleuropneumonia during the Civil War, Harvard's daring fling at higher veterinary education (1882-1901), Winchester's bold attack on bovine tuberculosis before much was known about tuberculin west of the Appalachians, not to mention a lot of pioneering in local association work. Yes, my friends, it would take a stack of reams to tell the romantic story

Paul Revere, American engraver and patriot. His midnight ride from Charlestown to Lexington, in April 1775, is his most famous exploit. He also was one of the leaders in the Boston Tea Party.

of Boston in the development of American veterinary medicine. Even its self-hypnosis of fifty-four years while the boys struck out to explore virgin territory in the westward direction is a moving chapter now that we come back, like the prodigal son, to be received with open arms.

Recollections of the 1892 meeting are vivid. To leaders with a watchful eye on the behavior of the colleges, the Boston meeting of that year was more than just another gathering of the Babbitts. The little matter of whether veterinary medicine was going to bog down in the mire of low educational standards or join the march of medical science by stepping up from two short midwinter sessions to an honest-to-goodness three-year course, was *settled once and for all time at the Boston meeting of 1892.* And that's not trivia as of 1946, because that meeting is a milestone to mark in our history book and the first successful step taken toward the present educational status of veterinary medicine. Here was the Boston battle line-up: the Hughes-Baker-Withers Chicago Veterinary College, Liautard's American Veterinary College, and Wattles' new Kansas City Veterinary College on the two-year front and Huidekoper's University of Pennsylvania, Osgood-Lyman's Harvard, MacEachran's Montreal Veterinary College, and McKillip's new corporation, represented by Schwartzkopf, occupying the three-year trenches. Law's Cornell was marking time waiting for ammunition (an appropriation), and Andrew Smith, of the Ontario Veterinary College, across the international border was standing by with tongue in cheek. When the smoke cleared away, the two-year army under the generals heretofore named was retreating and three years later, under a continuous bombardment, it surrendered unconditionally. How the defeated forces reorganized for the battle against the four-year course is not within the scope of this piece. The battle for the three-year course lasted seventeen years (1875-1892) and the one for the four-year course, twenty-one years (1896-1917). The Boston meeting of 1892 was to the former combat what the Kansas City meeting of 1917 was to the latter. The strategy of these battles was arranged behind closed doors with nothing but subtle, hush-hush sniping on the outside. The G.I.'s of the ranks knew nothing and cared less about what was transpiring until the battle was over and they found themselves a notch higher on the scale of human differentiation, despite their carefree ways. That's why such historic steps are not matters of common conversation.

The story of Huidekoper's triumph at Boston is fascinating. He was elected president at Recital Hall in Chicago at the meeting of 1890 with but few of the voters knowing what he was up to. He had the "three-year resolution" read into the records at the Washington meeting of 1891, and enacted into a by-law at the Boston meeting of 1892. To make more sure of its passage, he brought Dr. William Pepper, provost of the University of Pennsylvania and Dr. John Marshall, dean of its School of Veterinary Medicine, to speak in behalf of the now famous resolution. It was thought and so stated (winking) that these distinguished figures of medical education "just happened to be passing through Boston that September day of 1892." Moreover, Boston (they say) was chosen as the meeting place because it would not be easy to defeat the forward step in the shadow of Harvard University where Osgood and Lyman had taken command of veterinary medicine and whence they had made themselves felt in no small degree throughout the country. Their connection with one of America's oldest and foremost institutions of learning couldn't be laughed off by the "two year army." So, as the Association treks once more to Boston let the memory of these two leaders be not slighted. They were not only leaders in education, who left deep tracings of their work, but they were practitioners and strong advocates of high ethical standards. In looking back over these early acquaintances, one may well wonder if we are now creating their equals as gentlemen-scholars-educators-practitioners, meaning such figures as Osgood, Lyman, Law, Huidekoper, Harger, Adams, McKillip, and others whom one could pick as patterns to emulate.

A notable event of the meeting was the election of Isaiah Michener, a nongraduate, to honorary membership—a worthy tribute to a worthy man. By contrast, there were charges for unprofessional conduct brought against two prominent practitioners: George H. Berns, of Brooklyn, for patenting, dealing in, and advertising "patent fomentation pads", and against C. C. Lyford, of Minneapolis, for the same offense in connection with his "patent impregnators." The complainants were J. F. Winchester, Thomas B. Rayner, and L. McLean.

The meeting of 1892 in Boston was a momentous time for veterinary medicine. That's why it has never been forgotten. It all seems like yesterday. Were that more men interested in higher veterinary education at that time were living to hold a jubilee at Boston in August, 1946.— *L. A. M.*

Humane Act Award

Members of the AVMA and readers of the JOURNAL are again urged to make nominations for the Humane Act Award, in accordance with the general plan which has been operating during the past two years. It is the hope of the Humane Act Award Committee that the number of nominations will continue to increase year by year, since only when veterinarians and members of humane societies in all parts of the country begin to focus their attention

on this subject will the most worthy recipient be found.

Every veterinarian knows of some young person in his community who has performed an act of kindness and consideration for dumb animals, and it is hoped that each one will take the time to send in the name, date, and essential facts regarding such an act.

s/W. A. YOUNG, *Chairman.*

Board of Governors Meet

Executive Board Chairman C. C. Hastings, President James Farquharson, and President-Elect B. T. Simms were in Chicago on May 9, 1946, for an all-day session of the Board of Governors. Reports on progress of the Boston convention plans, the Research Fund Campaign, the status of the National Science Foundation legislation, and a number of other matters were reviewed. A proposal to utilize federal veterinary inspectors of the Poultry Inspection Section, Dairy and Poultry Branch of the U. S. Department of Agriculture, on a year-round basis by employing them for poultry disease-control work, when not engaged in inspection activities, was discussed with the Board by representatives of the Department.

Council on Education Holds First Meeting

All members of the newly organized Council on Education (*see* the JOURNAL, April, 1946, p. 273) met in Chicago on May 10, 1946, to activate the program and work of the council. The "Essentials of an Acceptable Veterinary School" were revised and a number of reports on inspection of accredited veterinary colleges were reviewed.

A subcommittee was appointed to obtain information necessary to the evaluation (not accreditation) of foreign veterinary colleges. This information is becoming increasingly necessary for the guidance of state examining boards because of foreign graduates who are coming to the United States since the end of the war and, further, because some prospective veterinary students from this country intend to study in foreign colleges and then return to practice in the States.

Dr. W. L. Boyd has been elected chairman of the Council and Dr. James Farquharson secretary. Their terms will expire at the annual meeting of the Council, which will be held during the Boston convention. The executive committee of the Council which is charged with the inspection of veterinary colleges consists of Drs. W. A. Hagan, James Farquharson, and W. A. Aitken. Other members of the Council are: Drs. C. C. Hastings, S. W. Haigler, M. S. Shahan, G. A. Edge, and Col. Seth C. Dildine.

Proposed Amendments to Constitution and Administrative By-Laws

At the 1945 business meeting, amendments were submitted to the House of Representatives for final action at the 1946 session. They were published in the May Issue (p. 348) and appear in this issue on page 401.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BACH, CLARENCE C.
Sebewaing, Mich.
D.V.M., Michigan State College, 1938.
Vouchers: C. F. Clark and B. J. Killham.

DAVIS, O. G.
Roxboro, N. Car.
D.V.M., United States College of Veterinary Surgeons, 1923.
Vouchers: Wm. Moore and W. R. Baynes.

GREENBERG, MARK L.
115 Pendleton St., New Haven 11, Conn.
D.V.M., Kansas State College, 1940.
Vouchers: S. Jonas and O. Sussman.

GUTHRIE, RICHARD S.
Camp Forrest, Tullahoma, Tenn.
D.V.M., Cornell University, 1930.
Vouchers: A. J. Shull and G. H. Hopson.

JAKSEKOVIC, STJEPAN
Hotel Karsten, Kewaunee, Wis.
D.V.M., University of Zagreb, Yugoslavia, 1931.
Vouchers: J. G. Hardenbergh and R. C. Klussendorf.

WEAVER, GEORGE L. H.
Dept. of Animal Pathology, Michigan State College, East Lansing, Mich.
D.V.M., Alabama Polytechnic Institute, 1940.
Vouchers: C. F. Clark and B. J. Killham.

YAGER, HENRY
Somerset, Orange Co., Virginia.
D.V.S., United States College of Veterinary Surgeons, 1910.
Vouchers: H. S. Miller and H. C. Givens.

Second Listing

Emiliani R., Enrique, Apartado Nacional 51, Cartagena, Colombia, S. A.

Emmerson, James H., 61 Hancock St., North Quincy, Mass.

Henry, Leo M., 1420 So. 38th St., Milwaukee 4, Wis.

Henshaw, Milo J., 403 S. Ionia St., Albion, Mich.

Johnson, Stephen N., 521 So. Clinton, Dallas 11, Texas.

Lovell, V. E., Pender, Neb.

Scales, James W., Box 536, State College, Miss.
Studer, Sebastian N., 6640 Lindenwood Pl., St. Louis 9, Mo.
Wong, Tit, UNRRA, Greece Mission, APO 512, c/o P.M., New York, N. Y.

1946 Graduate Applicants
First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Texas A. & M. College

BILDERBACK, WILLIAM R., D.V.M.
515 St. Louis Ave., Fort Worth 4, Texas.
Vouchers: L. E. Foote and D. J. Anderson.

BOAZ, WILSON O., D.V.M.
1712 W. 3rd, Pecos, Texas.
Vouchers: S. B. Shannon and H. B. Mills.

STRICKHAUSEN, GEORGE III, D.V.M.
Bandera, Texas.
Vouchers: J. D. Williams and E. A. Henderson.

State College of Washington

MOON, CHARLES E., D.V.M.
P. O. Box 426, Renton, Wash.
Vouchers: E. E. Wegner and L. J. Meyer.

Second Listing

Alabama Polytechnic Institute

Acree, James A., D.V.M., 1234 Challen Ave., Jacksonville 5, Fla.
Amy, J. Philip Jr., D.V.M., P. O. Box 324, Iota, La.
Ashley, Baine G., D.V.M., P. O. Box 512, Apopka, Fla.
Boozer, Harold W., D.V.M., R. F. D. No. 2, Jacksonville, Ala.
Culpepper, Moley D., D.V.M., Cusseta, Ga.
Davis, Erwin D., D.V.M., 1519 W. Court St., Gainesville, Fla.
Duckworth, John F., D.V.M., Greenville, Tenn.
Hart, Clifton L., D.V.M., Marianna, Fla.
Huff, James M., D.V.M., McCrory, Ark.
Johnson, Kibry K., D.V.M., 506 Moreland Ave., N. E., Atlanta, Ga.
Jordan, James E., D.V.M., P. O. Box 208, Carrollton, Ala.
Kirby, Robert A., D.V.M., 615 S. 84th St., Birmingham, Ala.
Kronfeld, Gelfer, D.V.M., Herndon, Va.
Lancaster, Rodman L., D.V.M., Vanceboro, N. Car.
Lindsey, Herbert F., D.V.M., 403 Terracedale, Griffin, Ga.
McCarty, George F. Jr., D.V.M., 934 N. Broadway, Knoxville, Tenn.
Peters, Orin C., D.V.M., Box 725, Auburn, Ala.
Phelps, Guy J. Jr., D.V.M., 108 N. Lawrence St., Montgomery, Ala.
Powell, James C. Jr., D.V.M., Waynesboro, Ga.
Sapp, Clarence C. Jr., D.V.M., 519 Pine Ave., Albany, Ga.
Shirer, William H., D.V.M., Gastonia, N. Car.
Sibley, Neal J., D.V.M., Russeville, Ala.
Smalley, Frarie C., D.V.M., 122 Elm St., Dublin, Ga.
Stapleton, Robert T., D.V.M., 605 Harrold Ave., Americus, Ga.
Tinsley, Harold D., D.V.M., Danville, Va.
Waldeck, George R., D.V.M., 1800 S.W. 11th St., Miami 35, Fla.
Williams, James E., D.V.M., 179 Poplar St., Jackson, Tenn.

Colorado A. & M. College

Rucker, Ellwyn E., D.V.M., Henderson, Colo.
Wayt, Lewis K., D.V.M., 140 E. Park Ave. (P. O. Box 1048), Durango, Colo.

Michigan State College

Smith, Ora L. II, D.V.M., 260 River Lane, Dearborn, Mich.

Ohio State University

Adams, Boyd, D.V.M., Box 106, East Palestine, Ohio.
Barth, Howard J., D.V.M., Wellington, Ohio.
Boyd, James B., D.V.M., 296 Beech St., Geneva, Ohio.
Bruckner, Edwin, D.V.M., 645 Tiffin Ave., Sandusky, Ohio.
Carver, James E., D.V.M., Michigan City, Ind.
Crago, Wilbur H., D.V.M., Kinsman Ohio.
Cross, Robert F., D.V.M., 194 W. Home St., Westerville, Ohio.
Cryan, John H., D.V.M., Rt. No. 2, Westerville, Ohio.
Custer, Millwood A. Jr., D.V.M., 1927 Indianola Ave., Columbus, Ohio.
Davidson, Donald J., D.V.M., 1928 W. Market St., Akron, Ohio.
Emerson, Edward S., D.V.M., 235 S. Pierce St., Lima, Ohio.
Field, Clyde W., D.V.M., Rt. No. 3, Hamilton, Ohio.
Fox, James E., D.V.M., New London, Ohio.
Gainer, Joseph H., D.V.M., 337 E. Church St., Urbana, Ohio.
Goldstein, Harry E., D.V.M., Brice, Ohio.
Gonser, Robert C., D.V.M., 3123 N. Cleveland Ave., Canton, Ohio.
Greiner, Robert B., D.V.M., 277 E. Gates St., Columbus 6, Ohio.
Gross, W. Burnham, D.V.M., 2006 Alvin St., Toledo, Ohio.

Hanley, Jack E., D.V.M., 605 Valley St., Charleston, W. Va.
Hanover, John W., D.V.M., 136 Elmwood Ave., Evanston, Ill.
Hardin, Charles J., D.V.M., 233 Lee St., Toledo, Ohio.
Hersey, Charles W., D.V.M., North Waterford, Maine.
Hines, Martin P., D.V.M., Rt. No. 4, Greensboro, N. Car.
Houk, Donald C., D.V.M., 2805 Cedar St., Muscatine, Iowa.
Kandel, Eugene C., D.V.M., 1930 N. Main, Findlay, Ohio.
Kern, Dorian J., D.V.M., Neffs, Ohio.
Krill, Galen E., D.V.M., Boswell, Ind.
Laman, Edward F., D.V.M., 709 N. Washington St., Delphos, Ohio.
Larcey, Richard D., D.V.M., 17400 Oxford Ave., Cleveland, Ohio.
Lind, Ralph B., D.V.M., 815 Troy Pl., N. E., Canton, Ohio.
Loufman, William G., D.V.M., 19450 Battersea Blvd., Rocky River, Ohio.
Lyle, Clyde D., D.V.M., 920 Barstow St., Waukesha, Wis.
McRyre, Burnley W., D.V.M., South Hill, Va.
McWilliams, Kenneth E., D.V.M., Rt. No. 2, Mt. Gilead, Ohio.
Massie, Erby L., D.V.M., Turners Station, Ky.
Nussendorfer, Burr W., D.V.M., c/o Dr. J. R. Krohn, Cloquet, Minn.
Portman, Russell F., D.V.M., Rt. No. 2, Amherst, Ohio.
Rea, Frederick W., D.V.M., Rt. No. 10, Richmond, Va.,
Redding, Richard W., D.V.M., 2023 Perth St., Toledo, Ohio.
Ritter, George E., D.V.M., Cozaddale, Ohio.
Sage, Fred M., D.V.M., 7 E. Como Ave., Columbus 2, Ohio.
Sass, Robert W., D.V.M., 1525 Broadway, Toledo, Ohio.
Schnelle, Robert C., D.V.M., Minster, Ohio.
Shartle, Willard H., D.V.M., Hamilton, Ohio.
Shashek, Kenneth V., D.V.M., Rt. No. 4, Edwardsville, Ill.
Sigler, Robert R., D.V.M., Cortland, Ohio.
Stader, Robert M., D.V.M., P. O. Box 88, Ardmore, Pa.
Stengel, Charles H., D.V.M., Rt. No. 7, Sidney, Ohio.
Stockstill, Raymond W., D.V.M., No. 2, Sidney, Ohio.
Updike, John J., D.V.M., R.R. No. 4, Lebanon, Ind.
Weaver, Sheridan L., D.V.M., 3154 Neosha Rd., Youngstown, Ohio.
White, Thomas P., D.V.M., Rt., 2, Canal Winchester, Ohio.
Willen, Milton L., D.V.M., 1420 11th St. N.W., Canton, Ohio.
Wittig, John D., D.V.M., Rt. No. 1, Box 314, Portsmouth, Va.

University of Pennsylvania

Andersen, Allen C., V.M.D., 5609 Willows Ave., Philadelphia 43, Pa.
Barto, Paul B., V.M.D., 323 Wyoming Ave., Audubon, N. J.
Berger, Robert L., V.M.D., Star Route, Hamburg, Pa.
Bertolet, Roy D., V.M.D., Herschel & Kelvin Ave., Somerton, Philadelphia, Pa.
Borger, Elwood H., V.M.D., R. D. No. 2, Northampton, Pa.
Brennan, Bernard F., V.M.D., 645 E. Sixth St., Plainfield, N. J.
Gabriel, Bernard, V.M.D., 326 Gladstone St., Philadelphia 48, Pa.
Gans, Joseph H., V.M.D., 242 Linwood St., New Britain, Conn.
Hinkel, Donald E., V.M.D., Shohola, Pike, Pa.
Lackey, Donald W., V.M.D., Lenoir, N. Car.
Langer, Peter H., V.M.D., Rt. No. 304, New City, Rockland Co., N. Y.
Mehnert, Erich C., V.M.D., 200 Summit Ave., Bogota, N. J.
Oster, Martin S., V.M.D., 2504 Atlantic Ave., Atlantic City, N. J.
Phillips, Gordon F., V.M.D., B.A.I., Dept. of Agriculture, Charleston, W. Va.
Ramos, Teodoro, V.M.D., Libertadores 363, San Isidro, Lima, Peru.
Stevens, Glen W., V.M.D., Angels, Pa.
Tamm, Eddie L., V.M.D., 1342 Prospect Dr., Pomona, Calif.

Texas A. & M. College

LeJeune, John E. Jr., D.V.M., Sta. A, Rt. 5, Box 417-A, New Orleans, La.

U. S. GOVERNMENT

Conference on Newcastle Disease.—Dr. B. T. Simms, chief of the Bureau of Animal Industry, USDA, called a conference of a representative group of poultry pathologists and state regulatory officials to discuss Newcastle disease (pneumoencephalitis) on May 2 and 3, 1946.

The program, which was presented at Washington, D. C., included reports on the disease from the various states, discussion of control measures, and formulation of recommendations to the poultry industry.

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Director of Regional Laboratory.—Dr. A. H. Groth has been appointed director of the Regional Animal Disease Research Laboratory, Auburn, Ala., to assume the position left vacant when Dr. B. T. Simms was elevated to the position of chief of the Bureau of Animal Industry.

Born in Iowa, Dr. Groth graduated from Iowa

State College with a B. S. degree in agriculture in 1921, went to Colorado State College for graduate work and to become a member of the research and teaching staff. Later, he moved to Texas A. and M. College, and then returned to

Dr. A. H. Groth

Iowa State College for work leading to the degree of D. V. M. in 1931. After serving the Minnesota Livestock Sanitary Board for some years, he moved to Louisiana State University, Baton Rouge, where he has been engaged in research and teaching activities.

Dr. Groth joined the AVMA in 1936 and is at present serving as chairman of the Committee on Nutrition.

Veterinary Personnel, Meat Inspection Division Transfers

Edwin A. Beckcom, Jr., from Atlanta, Ga., to Fort Worth, Texas.

Jacob C. Blumenthal from St. Paul, Minn., to Trenton, N. J.

Thomas W. Boman from Jackson, Miss., to Columbia, S. Car.

Stokes H. Burgess from So. St. Paul, Minn., to Helena, Mont.

R. Cullen Dodds from Omaha, Neb., to So. St. Paul, Minn.

J. E. Dwyer from Salt Lake City, Utah, to San Diego, Calif., in charge.

G. V. Grewell from Portland, Ore., to Seattle, Wash.

Wm. C. Jamison from Tacoma, Wash., to Los Angeles, Calif.

C. A. Johnston from Tacoma, Wash., to Seattle, Wash.

E. R. Laiho from Detroit, Mich., to Chicago, Ill.

Everett P. Maitland from Springfield, Ill., to Jefferson City, Mo.

Elmer L. Metcalfe from Frankfort, Ky., to Omaha, Neb.

C. Stuber Miller from Portland, Ore., to Des Moines, Iowa.

F. G. Miller from Ogden, Utah, to Salt Lake City, Utah, in charge.

W. Wayne Miller from Beltsville, Md., to Chicago, Ill.

F. M. Painter from Columbus, Ohio, to Louisville, Ky.

Albin G. Pass from Jacksonville, Fla., to Frankfort, Ky.

Lewis E. Seay from Jackson, Miss., to Fort Worth, Texas.

Fred M. Shigley from Oklahoma City, Okla., to Bismarck, N. Dak.

Leo L. Shilling from St. Joseph, Mo., to E. St. Louis, Ill.

Claude A. Smith from Beltsville, Md., to Lansing, Mich.

Frank B. Wilkinson from Kansas City, Kan., to Jefferson, Mo.

J. M. Wineinger from So. St. Paul, Minn., to Salt Lake City, Utah.

Virgil A. Yount from Little Rock, Ark., to Denver, Colo.

RETURNED FROM MILITARY DUTY

R. J. Robertson, Los Angeles, Calif.
L. D. Boston, Oklahoma City, Okla.
Norman G. Claus, Detroit, Mich.
Arthur R. Thiele, Chicago, Ill.
R. A. Moody, Birmingham, Ala.
Chas. C. Newhart, Philadelphia, Pa.
Oscar Sussman, New Haven, Conn.
Daniel P. Arron, Seattle, Wash.
J. H. Hathaway, Ft. Worth, Texas.
Samuel Stieber, Newark, N. J.
Ralph C. Watson, Albany, Ga.
I. V. Weisberg, St. Louis, Mo.
Dean E. Flagg, West Fargo, N. Dak.
Greydon P. Forrest, Cedar Rapids, Iowa.
Eli Gersten, New York, N. Y.
C. F. Thumm, Jr., Philadelphia, Pa.

RETIRED

A. R. Zumwalt, San Diego, Calif.
G. M. Parrish, Louisville, Ky.
G. E. Sloulin, Seattle, Wash.
Walter A. Sullivan, Indianapolis, Ind.

RESIGNED

William H. Bassett, Omaha, Neb.
C. P. Bunnell, San Francisco, Calif.
Francis A. Caspar, Jacksonville, Fla.
E. M. Christopherson, Providence, R. I.
Robert P. Clark, Indianapolis, Ind.
James M. Converse, Frankfort, Ky.
Tyrus V. Dahl, Raleigh, N. Car.
Harry E. Davis, Portland, Ore.
Truman B. Fleener, Oklahoma City, Okla.

Oswald H. Graham, Raleigh, N. Car.
S. G. Graff, St. Louis, Mo.
M. L. Inman, San Francisco, Calif.
Leo R. Johnson, San Diego, Calif.
R. F. Lovell, Los Angeles, Calif.
R. A. McFarland, Los Angeles, Calif.
John W. Osebold, Portland, Ore.
Walter E. Pate, Fort Worth, Texas.
A. Blair Stevens, Portland, Ore.
Raymond C. Storey, Olympia, Wash.
Omar G. Werntz, Oklahoma City, Okla.
Donald A. Work, Oklahoma City, Okla.

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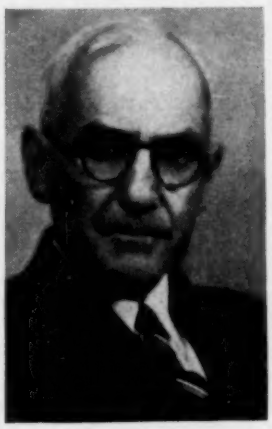
Dr. A. E. Wight Retires.—Dr. Alexander E. Wight, for the last eighteen years director of the campaign to eradicate bovine tuberculosis and for ten years also director of the brucellosis control program, has retired at the age of 70.

Entering the service of the USDA in 1898,



Dr. A. E. Wight

he has been with the Department continuously during the forty-seven years which have intervened. His first duties were in meat inspection, in Boston, but he later served in the animal disease control projects in various parts of the country. His wide experience and marked success in controlling livestock diseases have won him recognition throughout the veterinary field.

Dr. Wight was president of the AVMA in 1940-41, and has also been president of the U. S. Livestock Sanitary Association and of the District of Columbia Veterinary Medical Association.

He was born in Medfield, Mass., received his veterinary education at Harvard Veterinary College, Boston, receiving the degree of M.D.V. in 1897. He will reside in Boston in the near future.

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Streptomycin Allocation.—The Civilian Production Administration has established an allocation program for streptomycin. There has been a mistaken belief that the Army controls the entire supply of this antibiotic agent, whereas it actually controls only about 30 per cent thereof. Nevertheless, production is so limited that there has never been enough to permit extensive experimental work. According to The Surgeon General's office, there will be no commercial distribution of streptomycin at this time, nor will the producers supply it directly upon civilian request. The physician may request it from Dr. Chester S. Keefer, Evans Memorial Hospital, 65 East Newton, Boston, Mass.

AMONG THE STATES

Alabama

Research Grant to Tuskegee.—*Science* (Feb. 15, 1946) announces a grant of $5,400 by Swift & Company to Tuskegee Institute for research work in animal nutrition with specific reference to Mung bean and other proteins for the feeding of poultry. Dr. W. E. Bolton, assistant professor of chemistry, and Dr. E. J. Jefferson, assistant professor of poultry husbandry, staff members of the George Washington Carver Foundation, will direct the program. The grant includes funds for two graduate research assistants.

Arkansas

Mobile Laboratory.—In an article from the *Arkansas Gazette* (March 24), contributed by Dr. Frank Hurlbut, of Yellville, Dr. Joe S. Campbell, state veterinarian, reports that a mobile laboratory has been acquired by his department, and was put into operation recently. It will be used for diagnosis of livestock diseases and parasites, and will also prepare specimens for shipment to the state laboratory when diagnosis cannot be completed with its limited equipment.

Six trucks, each equipped with a 7.5-ton tank and a power-driven spray pump, will also be put into service to determine the relative efficiency of spraying over dipping for ticks and lice.

California

U. C. Veterinarian to China.—Dr. J. R. Beach, professor of veterinary science on the Berkeley campus of the University of California, has left to join Dr. H. J. Stafseth, Michigan State College, Dr. Cecil Elder, University of Missouri, and Dr. Harry E. Furgeson, of Bozeman, Mont., in China.

All of these men are working under the UNRRA program to aid in the development of

a sound program for raising healthy livestock in China.

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USDA Scientists at Veterinary Conference.—At the California Veterinary Conference held at the California Polytechnic School, San Luis Obispo, on January 15-17, Dr. Benjamin Schwartz, U. S. Bureau of Animal Industry, Washington, D. C., and Dr. Harry W. Schoening, director of the U. S. Experiment Station, Beltsville, Md., were guest speakers.—*Western Dairy Journal.*

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Cattlemen Organize Spray Ring.—The cattlemen of San Luis Obispo county last spring organized a countywide spraying program to combat heel flies and grubs. Using portable spray rings of 100-gal. capacity, they traveled to all parts of the county spraying cattle in chutes and in small corrals. By mixing 20 lb. of commercially mixed rotenone sulphur in the tank they were able to produce 100 gal. of spray at a cost of $8.80, and by applying this through a Chipman type nozzle at a pressure of 350 to 400 lb., they were able to spray 135 head from one tankful at a cost of about 6.5 cents per head. Three treatments were given, the first as soon as grubs can be felt under the skin, and the other two at intervals of about thirty days. A well-organized, six-man crew will spray from 80 to 100 head per hour.—*Western Live Stock J., February, 1946.*

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Psoroptic Mange Recognized.—An outbreak of psoroptic mange, which is extremely rare in California, was reported in two large herds of feeder cattle near Dairyland in Madera county last December, according to the *Western Live Stock Journal.* One of the herds contained 450 head, the other 500 head. Dipping vats were built, the animals have been dipped, and the condition is thought to be well under control.

Connecticut

Quarterly Meeting.—The regular spring meeting of the Connecticut Veterinary Medical Association was held in Waterbury on May 1, 1946. Dr. E. E. Lamoureux, director of the Division of Preventable Diseases, State Department of Health, presented "An Epidemiological Report on Brucellosis in Connecticut," which was discussed by Dr. Edward J. Godfrey, Health Officer, of Waterbury. Dr. Kenneth F. Hilbert, director of the Farmingdale division of the Poultry Pathology Laboratory, New York State Veterinary College, talked about "New Chemotherapeutic Measures in Some Common Diseases of Poultry." Dr. Edwin Laitinen, AVMA resident secretary, brought news of the "Plans and Preparations for the 1946 AVMA Convention in Boston." An exhibit depicting early veterinary medicine in Connecticut was displayed.

s/GEORGE E. CORWIN, *Secretary.*

Idaho

New Injurious Weed.—The death of over 1,000 sheep from poisonings by *Halogeton conglomatus*, a weed similar to Russian thistle, suspected of having been brought in with sheep imported from Iran, is an example of disease dispersion over a small world. The diagnosis was made by Dr. Scott B. Brown (Wash. '16), state sheep inspector, and the plant was identified by the veterinary service of the University of Nevada. The plant was first discovered in 1935 and is yet to be given a common name. A pound and a half is lethal for sheep. Other pastoral animals are not affected.

Illinois

Eastern Illinois Association.—An evening meeting of the Eastern Illinois Veterinary Medical Association was held on March 11, at Champaign.

Dr. L. E. Boley and Dr. N. D. Levine recounted some of their interesting experiences while in Army service. The former attained the rank of lieutenant colonel in the Veterinary Corps, while the latter was a major in the Sanitary Corps; both recently returned to their positions in the College of Veterinary Medicine of the University of Illinois.

A round-table discussion of practice problems was followed by election of officers for the coming year: Dr. D. L. Kerlin, Champaign, *president;* Dr. C. C. Morrill, University of Illinois, *secretary.* The new president has recently taken over the practice vacated by Dr. P. J. Meginnis.

s/C. C. MORRILL, *Secretary.*

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Leader in Public Welfare.—Since a hospital, staffed and equipped for the scientific care of the sick, writes its own encomium by what it is and what it does and is somewhat alien to veterinary medicine, the remodeling of the Christian Welfare Hospital of East St. Louis, at the cost of $150,000, would be passed up as a local news item but for the fact that the chairman of its executive board, St. Clair Hospital Association, is none other than Dr. Anthony E. Bott (C.V.C. '13), president of the Corn Belt Serum Company, chairman of Procurement and Assignment of veterinarians in Illinois, ex-president of the Illinois State Veterinary Medical Association, and longtime head of the Board of Education of East St. Louis, together with his activities as a leader of uplifting movements in that important industrial city. A clipping from the *East St. Louis Journal* imposes the duty to mention that Dr. Bott not only erects monuments for his city, but is himself a monument to his profession.

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Anti-Cruelty Needs.—Among the anti-cruelty needs of the state, pointed out in the pictorial annual report of The Anti-Cruelty Society of

Chicago, is the regulation of reckless riding on the bridle paths strewn through the parks and the vast forest preserves skirting metropolitan Chicago. Another need is the prevention of suffering among common farm animals. Quoting from the report: "There is undoubtedly more actual suffering occurring among common farm livestock than in any other group of creatures with which we have to deal." State-wide humane work is recommended.

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Dr. Fidler Appointed Superintendent of Livestock Industry.—For the first time, a veterinarian heads the Division of Livestock Industry in Illinois, Governor Dwight H. Green having appointed Dr. C. E. Fidler (C.V.C. '05)

Dr. C. E. Fidler

as superintendent following the resignation of Mr. George A. Fox from that position on April 1, 1946. Dr. Fidler had been chief veterinarian of the division for a number of years. That office will remain vacant for the time being, at least, since the duties of the two positions were largely the same. On taking office as superintendent of the division, Dr. Fidler stated, "All practicing veterinarians in the state should give their full support to this division and familiarize themselves with all the activities pertaining to disease control. We need your coöperation and support."

s/W. D. DAUGHERTY, *Secretary,*
Illinois Veterinary Medical Association.

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International Resumes.—After a lapse of four years on account of the war, the International Live Stock Exposition will be held in Chicago on November 30 to December 7. Its last show was held in 1941, during the week prior to Pearl Harbor.

A Hint to Prospective Horseshoers.—Dr. Jack Seiter, horseshoeing editor of *Ironsmith*, formerly *Journal of the National Master Horseshoers Association*, the oldest magazine of its kind, debunks the widely heralded idea that horseshoeing is a trade of great opportunity for young men to enter *vis-à-vis* the present prices of bar iron, ready-made shoes, labor, and the small earnings per horse. The cost for horseshoes averages 17.5 cents each or three times more than thirty or forty years ago, and the wages of journeymen horseshoers have increased at about the same rate ($3.50 to $12.00 a day), while the charges for shoeing a horse all around have increased only from $2.00 or $2.50 to $3.50 per horse. Moreover, the average number of horses shod per day per man has dropped from 12 to 8 or 10. Although an allowance may be made for higher prices received for shoeing fancy horses (riding, racing, show), the increment is not sufficient in any event to make up for the discrepancy between costs and earnings.

Thus, a capable critic of long experience in leather apron, with cold words and figures, shows up the false claptrap of the armchair sages. As to the alleged prospects of the traveling horseshoer, "An ounce of brain, a lead pencil, and a piece of paper" is what Seiter advises to dispose of that fetich.

• • •

Tulley Brothers, Horseshoers.—The death of John Tulley, 83, at his home in Chicago on March 27, recalls some great horseshoeing shops of the nineteenth century: Williams & McKillip at 22nd and State Streets; D. S. Jaffray's, *père* of distinguished veterinarians, on the near West Side; and Tulley Brothers, at 47th and State Streets.

Scored by the number of fires ablaze, the first two were the larger, but Tulley Bros., located between the swank harness horses of Hyde Park on one side and the saddle horses of the Union Stockyards on the other, were tops in select patronage. The coach-and-fours, Kimball broughams, Glens Falls buckboards, Brewster runabouts, smart victorias, snappy poleteams, and riders-of-the-yards, represented the kind of horseshoeing the Tulley's were doing. Artisans all, they drew the better class of harness and saddle horses to their orderly shops. The Tulley horseshoeing shop was opened in 1885 and did not close until 1928 when the automobile had finally finished stealing the show. One recalls John, his brothers Michael and James, and Orville, son of the latter, who carried on to the unhappy end.

• • •

Animals In The News.—This is the title of a radio program sponsored on radio station WAAF, Chicago, each Monday at 11:30 a. m. by The Anti-Cruelty Society of Chicago, of which Dr. W. A. Young is managing director.

Advisory Board Meets.—The 1945 session of the Illinois legislature appointed an advisory board of the Illinois Department of Agriculture, which has held several meetings. The board believes that calf vaccination at state expense should be made available to any cattle owner without prebleeding the calves or adult animals in the herd.

s/A. K. KUTTLER, *Inspector in Charge.*

• • •

Judge Flies to Dog Show.—Capt. Will Judy became the first American to officiate at a South American dog show when he flew from Chicago to Rio de Janeiro, 5,300 miles away, to judge at a dog show on May 5, 1946.

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Abbott Laboratories.—Mr. Rolly M. Cain, formerly executive vice president, was recently elected president of Abbott Laboratories, and S. DeWitt Clough, former president, became chairman of the board of directors.

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Brucella Vaccination Experience.—A herd of 126 cattle over 2 years of age, in which calfhood vaccination has been practiced since 1936 and to which 10 adult reactors were added March 31, 1944, reports 12 abortions in 1945. There had been five in 1944, and two each in 1943 and 1942. Of the 54 animals previously vaccinated as calves, 12 abortions do not represent a serious "break", but it is interesting to note that eight of these were in animals vaccinated in 1942, and four in unvaccinated animals. Of these eight, five were in negative, one in suspicious, and two in positive animals.

s/A. K. KUTTLER.

Indiana

The Northwestern Association.—A delightful dinner session of the N.I.V.M.A. was held at the Mudlavia Hotel, Kramer, on March 28. Dr. Harold E. Moses, associate pathologist, Purdue University, spoke on Newcastle disease of poultry.

s/ C. L. POLLOP, *Secretary.*

• • •

Veterinarians on Program of Feed Manufacturers Association.—Dr. A. H. Groth, chairman of the AVMA Committee on Nutrition and newly appointed director of the Regional Animal Disease Research Laboratory at Auburn, Ala., was one of the principal speakers on the program of the American Feed Manufacturers Association whose annual meeting was held at French Lick, May 22-24, 1946. Dr. Groth discussed "The Veterinarian and the Feed Salesman."

Also featured on the same program was a talk by Dr. S. W. Haigler, St. Louis, chairman of the Joint Committee on Foods of the AVMA-AAHA. Dr. Haigler discussed some of the feeding problems encountered by dog owners and nutritional diseases seen in dogs by veterinarians. He also participated in a panel discussion on dog foods and dog nutrition.

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Personal.—Dr. H. J. Magrane II has been released from military duty in the Veterinary Corps, where he served in the rank of captain. Dr. Magrane spent twenty-six months overseas, his last assignment being in the Rome area. For performing certain duties with the Italian food depots, in addition to his regular duties, he was decorated by the Italian government with the insignia of Knight Commander in the Order of St. George of Carthenia, and also Knight of the Order of The Crown of Italy. He served in America, Africa, the Middle East, and Europe, participating in the Rome-Arno campaign to gain one battle star.

Dr. Magrane (Tex. '43) has returned to the Magrane Veterinary Hospital, Mishawaka, where he is associated with his father, Dr. H. J. Sr., and his brother, Dr. W. G. Magrane.

Iowa

East Central Association Meets.—Forty-eight veterinarians from 16 counties attended a meeting of the East Central Iowa Veterinary Medical Society at Cedar Rapids on April 11, 1946.

Dr. Chas. E. Bassler, of Ainsworth, presented a paper on "Supportive Measures in Treatment", which was discussed by Dr. Iva Dunn, of Atkins.

Dr. A. R. Menary, of Cedar Rapids, discussed "Municipal Dairy and Meat Inspection", with Drs. J. H. Spence, of Clinton; J. W. Griffith, of Cedar Rapids and L. A. Pierce, of Cedar Rapids, adding to the presentation.

Dr. W. S. O'Brien, of Ryan, spoke on "Swine

"Convention Number" Next Month

The July JOURNAL *will feature the full program of the Boston convention, including speakers and subjects for general sessions and sections, entertainment plans, Women's Auxiliary activities, educational and commercial exhibits, and meetings of related organizations.*

Be sure to use the hotel reservation blank which is being provided in the JOURNAL *each month (advertising page xxviii of this issue). Reservations should be made not later than August 1.*

Practice Problems." Dr. R. M. Hofferd, of Cedar Rapids, led the floor comments which followed.

Case reports were presented by Dr. Menary on "Cataract of the Eye of a Palomino Colt"; Dr. H. D. McCreedy, of North English, "Jitterbug Pigs"; Dr. Griffith, "Light Sensitization of Swine Due to Buckwheat and Sweet Clover"; Dr. J. C. Carey, of West Liberty, "Spavin in a Young Horse," and "Anterior and Posterior Pituitary Extract in Agalactia of Sows."

s/JOE W. GIFFEE, *Secretary-Treasurer.*

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Iowa State Establishes Research Center in Central America.—After two years of work on corn research in Central America by its specialists, Iowa State College has established a Tropical Research Center at Antigua, Guatemala, to be devoted to the broader aspect of agriculture and natural sciences, with special emphasis on maize and other native plants of Mexico and Central America. A number of graduate and undergraduate students will attend. The Center was made possible by a grant for basic research by the May Seed and Nursery Company of Shenandoah.

• • •

Associated Serum Producers' Program.—In addition to the nationwide campaign featuring "What the Veterinary Profession Means to Mankind", another series of messages emphasizes that the veterinarian can tell when hogs are in proper condition to be vaccinated, and that, through his skill and scientific knowledge, the veterinarian is best qualified to provide dependable immunization.

Kansas

Meet at Beloit.—Twenty-five veterinarians and their wives met on Sunday, March 24, for a dinner and program. The latter was presented by Drs. E. R. Frank and J. W. Lumb, of Manhattan, in the form of a motion picture and description of "Surgical Operations on Cattle." This was followed by a discussion of current veterinary problems in which most of the members present participated.

s/C. W. BOWER, *Secretary.*

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Veterinary Officer Returns from China.—Colonel C. H. Kitselman flew from the Chinese base to Hamilton Field, Calif., after spending twenty-five months in the Veterinary Corps. While in China, he was awarded the Bronze Star for meritorious conduct and the "Order of the White Cloud" from Generalissimo Chiang Kai Shek. At the end of his terminal leave, Colonel Kitselman will return to his position in the Department of Pathology at Kansas State College.

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Grub Control.—More than 18,000 head of cattle in Kiowa County have been sprayed twice, while 4,500 head have been dusted for grub control, according to John Smerchek, extension agent.

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Radio Interview.—Drs. E. L. Dicke and Kent R. Dudley were interviewed on a "Feed Conservation" program which was broadcast over station KMBC in Kansas City, on March 29, 1946.

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President Eisenhower Accepts Borden Award.—The Borden Scholarship Award in Veterinary Medicine amounting to $1,500, to be allocated at $300 annually, was accepted by President Milton S. Eisenhower, of Kansas State College. The award will go to the senior student of the Division of Veterinary Medicine who has earned the highest average grade during the freshman, sophomore, and junior years of the regular curriculum.

Louisiana

Veterinarian's Son.—Dickie Young, son of Dr. A. V. Young, of Shreveport, showed the grand champion fat calf at the recent annual Junior Livestock Show held at Louisiana State

Dr. A. V. Young, Shreveport, with his son Dickie and the grand champion fat calf of the Junior Livestock Show at L. S. U. The trophy, symbolic of this honor, was presented by the Illinois Central Railroad.

University. This is the second consecutive year that he has won the honor. The calf later sold for $3.00 a pound. As president of the Louisiana Veterinary Medical Association, Dr. Young presented the trophy, which was offered by the Illinois Central Railroad.

The Louisiana Veterinary Medical Association awarded showmanship trophies to the youngsters who won in the beef, dairy, and swine classes. These trophies were awarded by Dr. Young, as president of the association, and the showmanship of beef calves was judged

by Dr. A. H. Groth, who has just been appointed director of the Regional Animal Disease Research Laboratory at Auburn, Ala.

s/W. T. OGLESBY.

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Sweet Potatoes as Feed.—Four prize-winning Aberdeen-Angus steers were featured at the annual meeting of the Louisiana Sweet Potato Association, because they had been fed only on sweet potato feed and roughage.

Manitoba

That First Veterinary Practice Act.—Writes Dr. Alfred Savage, Manitoba Agricultural College, Winnipeg: "The JOURNAL for November states that California, in 1893, was the first to enact a veterinary practice act. As a matter of historical interest may I suggest that in the broadest American sense, priority might be found north of the forty-ninth parallel. The Veterinary Association Act of Manitoba was passed in 1890 and amended in 1896 and 1899. Queen Victoria's advisers may have made a few errors but they gave the veterinarians of Manitoba an Act that hardly could be improved upon."

s/ALFRED SAVAGE, *Winnipeg.*

[The JOURNAL appreciates the opportunity to place this important fact on record.

There's so much "America" north of the famous international boundary and below the historic *rio* to the south that the unqualified use of the word has become heretic and admittedly misleading. One is all too liable to forget that the christening in honor of Amerigo Vespucci (about 1500) was intended to apply to the two western continents. No doubt, the word got fastened to the folk of the United States because of the phenomenal increase in the population of that strip across the North American continent.—Editors]

Massachusetts

Veterinarian Speaks to Jersey Breeders.—Dr. F. F. Tenney, of Peterborough, N. H., spoke to the members of the Franklin County Jersey Breeders' Association at the thirty-first annual meeting on Feb. 22, 1946, using as his topics "Mastitis" and "Sterility in Cows."

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Monthly Meeting.—The Massachusetts Veterinary Association met at the University Club, Boston, on April 24, 1946. Lt. Colonel H. J. Robertson, of Boston, talked on "My Experiences in Iceland and Western England," and Dr. J. G. Hardenbergh, executive secretary of the AVMA, was present to confer with the members regarding budgetary problems of the approaching AVMA Convention.

s/E. A. WOELFFER, *Assistant Secretary.*

Mexico

Foot and Mouth Disease Resolution.—The Southwestern States and Republic of Mexico Livestock Sanitary Board Association met at Hermosillo, Sonora, Mexico, on April 15-16, 1946, with members in attendance from Arizona, New Mexico, Texas, Nebraska, Kansas, and several of the Mexican states. The highlight of the meeting proved to be the report of importation into Mexico and transhipment to Texas of a group of Brahman bulls which had originated in Brazil. These bulls had been confined in a maritime quarantine station where they had been dipped, had passed clinical laboratory examinations, and had lived together with ruminants and hogs used as detectors before being released from quarantine. Although these precautions were considered adequate by the Mexican authorities, it is the belief of the United States Livestock Sanitary officials that there still remains grave danger that foot-and-mouth disease could develop later. After discussion, the following resolution was passed at the meeting:

WHEREAS the importation of cattle from zones or countries where hoof-and-mouth disease is considered to exist would be detrimental to the cattle industry of the United States and Mexico and

WHEREAS, notwithstanding all reasonable sanitary precautions taken to prevent infection from cattle imported from affected countries, there still remains a possibility of infection to the cattle of the importing countries;

BE IT THEREFORE RESOLVED that the Southwestern States and Republic of Mexico Livestock Sanitary Board Association be placed on record as being opposed to the importation of cattle to the United States or Mexico from countries or zones where hoof-and-mouth disease is to be found to exist, and

BE IT FURTHER RESOLVED that this Association, through its president and secretary, respectively request the Governments of the United States and Mexico to prohibit the importation of such cattle.

Minnesota

Southern Society.—The Southern Minnesota Veterinary Medical Society met at Austin on May 2, 1946. Following inspection of the Swine Improvement Project of the Hormel Institute, there was a dinner at the Austin Country Club and then a program consisting of three talks:

Dr. George A. Young, of the Hormel Institute: "Some New Concepts of Disease Transmission."

Dr. Carl F. Schlotthauer, of the Mayo Foundation: "Bovine Mastitis."

Dr. H. O. Halvorson, of the Hormel Institute: "The Program of the Hormel Institute."

s/KARL KNOCHE, *Secretary.*

Missouri

Kansas City Association.—"Diseases of the Newborn" was the subject discussed at the regular meeting of the K.C.V.M.A., held at the Hotel Continental on April 6. The diseases of pigs, by Dr. J. L. Jones of Blackburn, diseases of calves, by Dr. George L. Bartholomes of Sheldon, and diseases of puppies, by Dr. Robert Andreas of Kansas City, composed the panel. Dr. L. H. Beebe, of Warrensburg, reviewed the discussion.

s/GAIL B. SMITH, *Secretary-Treasurer.*

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Dr. W. C. Schofield to Purina Mills.—Purina Mills, St. Louis, have employed Dr. W. C. "Bill" Schofield (I.S.C. '31) as poultry pathologist. Dr. Schofield had been a member of the staff of Louisiana State University since 1937, but had spent the past four years in the Veterinary Corps. He attained the rank of major in recognition of the excellent work he did in helping to organize and conduct the school of veterinary hygiene at the Chicago quartermaster depot. Upon his release from service, Dr. Schofield returned for a brief time to his work in Louisiana, but moved to St. Louis on March 1, 1946. s/W. T. OGLESBY.

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St. Louis District Meets.—Twenty-nine veterinarians attended the meeting of the St. Louis District Veterinary Medical Association on March 1, 1946, and listened to Dr. L. E. Bodenweiser present a paper on "Breeding Problems in Cattle." A lively discussion from the floor followed.

The association meets regularly on the first Friday of the month at the Roosevelt Hotel on Delmar Blvd., beginning promptly at 8:00 p. m. and adjourning promptly at 10:00 p. m.

s/C. W. DARBY, *Secretary.*

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St. Louis Association.—At the regular meeting of the St. Louis Veterinary Medical Association, on May 3, a panel discussion of large animal and regulatory problems was presented. Dr. M. J. Huggins, of Edwardsville, Ill.; Dr. L. A. Rosner, of St. Charles, Mo.; and Dr. J. P. Torrey, of the Corn Belt Serum Co., were the panel members who pooled their information on clinical, laboratory, and regulatory procedures to answer questions on a variety of subjects. Featured topics were brucellosis, erysipelas, sterility, clinical and laboratory diagnosis, and regulatory problems.

s/C. W. DARBY, *Secretary.*

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Summer Meeting.—The Missouri Veterinary Medical Association will hold its summer meeting on June 10 and 11, at the Colonial Hotel, Springfield. The following speakers have consented to appear on the program: Dr. James Farquharson, Fort Collins, Colo., president of the AVMA; Dr. W. L. Boyd, St. Paul, University of Minnesota; Dr. R. M. Hofferd, Cedar Rapids Iowa, Corn States Serum Co.; Dr. J. H. Krichel, Keokuk, Iowa, practitioner; and Dr. J. L. Jones, Blackburn, will conduct a question box.

s/J. L. WELLS, *Secretary.*

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Veterinary Radio Program.—The livestock health program may be heard over station KMBC, Kansas City, at 12:25 each Saturday afternoon. Each week a veterinarian from Missouri or Kansas is interviewed, following the pattern of scripts sent out by the AVMA, on a timely subject.

Nebraska

Golden Anniversary.—The Nebraska State Veterinary Medical Association is celebrating its golden anniversary, having been organized in 1896. A letter from President W. I. Nelson has been mailed to each member, along with a copy of the constitution and by-laws of the association, a list of the members and of the officers who have served through the years, and also a copy of the constitution and by-laws of the Women's Auxiliary and a list of its officers year by year.

The letter from the president calls the attention of the members to the fact that "By our work we have saved millions and millions of dollars to the Nebraska commonwealth. Likewise, we have played a part in alleviating the suffering of mankind from disease."

s/L. V. SKIDMORE, *Secretary-Treasurer.*

New York

Celebration Cancelled.—Lack of housing facilities is an insurmountable obstacle in the plans for a celebration to commemorate the semicentennial of the founding of the New York State Veterinary College, which has been scheduled for this fall. It is not yet possible to determine whether this is a postponement or cancellation, but there is no possibility of holding it during 1946.

s/R. R. BIRCH, *Chairman,*
Faculty Committee.

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Veterinarians in Zoo Work.—Dr. Leonard J. Goss of the Zoölogical Park, New York 60, N. Y., directs attention to a proposed meeting and informal discussion of the veterinary problems related to the keeping of wild animals for zoo and exhibition purposes and expresses the hope that veterinarians engaged in, or interested in, work of this nature will make a sincere effort to attend the AVMA convention in Boston, Aug. 18 to 22, 1946, and that they will contact Dr. Goss or Dr. Patricia O'Connor, Staten Island Zoo, Staten Island, N. Y., regarding such a meeting.

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New York City Association.—The Veterinary Medical Association of New York City held its

regular meeting on May 1, 1946, at the Hotel Pennsylvania. The guest speaker was Dr. George Hopson, of the DeLaval Separator Co., whose subject was "The Veterinarian and the Dairy Industry."

s/C. R. SCHROEDER, *Secretary.*

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Fiftieth Anniversary Meeting.—The American Veterinary College, a division of New York University, graduated a class in 1896. Seven members of this class survive, and six of these met on May 4, 1946, at the Grand Street Boys' Club in New York City. Those attending the meeting were: Dr. A. F. Bollinger, Brooklyn; Dr. George Cohen, New York; Dr. Leland D. Ives, Elizabeth, N. J.; Dr. M. J. Murphy and Dr. W. R. Rosekranz, New York; and Dr. F. A. Zucker, Elizabeth, N. J. s/L. D. IVES

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McKim Dons the Old Harness.—Col. Orville E. McKim, V. C., A.U.S., contemplating his separation from the Army after more than twenty-five years of service—World War I, interwar reserves, and World War II for more than five years—announces the reopening of his hospital and kennels in Port Chester, a palatial small animal establishment on Boston Post Road. The Colonel, who has been a colorful figure of the civilian veterinary service besides his experiences in two wars and a duteous worker in behalf of the Veterinary Corps during peacetime years, took a fling at labor *sans* glory in which too few engage 'til the shooting starts. Colonel McKim is the only American veterinary officer one can signalize as a German P.O.W. and will long be remembered internationally for his managerial work in the local arrangements of the Twelfth International Veterinary Congress in 1934. In the interwar period, he organized his local colleagues into a club which was instrumental in keeping the SPCA from founding unnecessary free clinics in Westchester County. The club has been transformed to the level of a local association affiliated with the state society. To the Colonel's credit is the reëmployment, as aides, of two former employees recently discharged after three and a half and two and a half years, respectively, in the Army.

Ohio

"Keep 'Em Healthy"—Dr. Walter R. Krill, dean of the College of Veterinary Medicine, was the guest of station WLW on Wednesday, April 24, 1946, at 12:40 p. m. The subject selected was "Factors Affecting Spread and Control of Disease", and it appeared on the "Keep 'Em Healthy" series of Everybody's Farm Hour.

s/A. G. MADDEN, JR.

Oklahoma

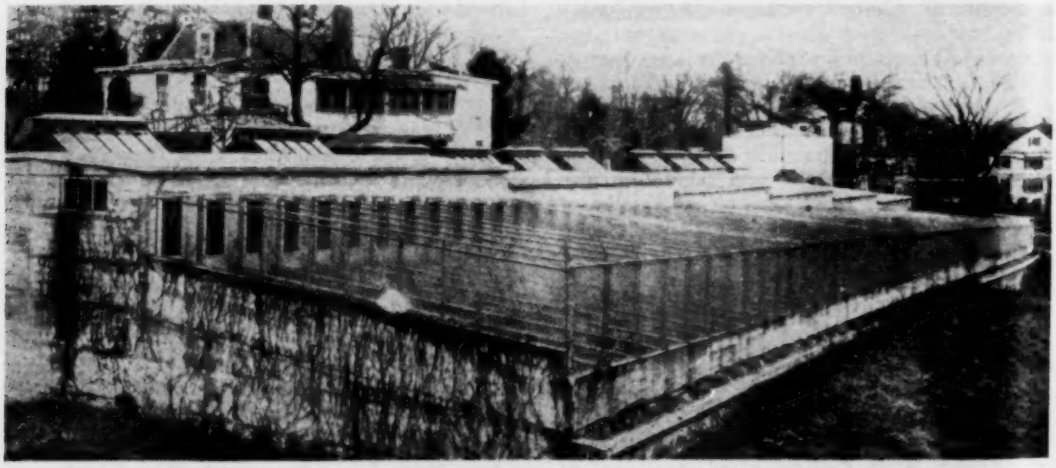
FFA to Spray Livestock.—The Antlers FFA chapter has purchased a power spray machine and will spray livestock for grubs, lice, and ticks at a fee of ten cents per head, according to the *Agricultural Leaders' Digest.*

Ontario

Honor Roll Being Compiled.—The Ontario Veterinary College is trying to obtain information regarding each graduate or student who served in World War II. The necessary facts have been secured regarding the following list of persons. It is believed that many more men have served but have not yet been reported to A. L. Shepherd, executive clerk, O.V.C., Guelph, Ontario. The information desired includes name, address, year of graduation, rank and decorations awarded. Anyone having such information regarding men not included in the list may send it to the address indicated above.

THOSE WHO PAID THE SUPREME SACRIFICE

Brown, N. H. V., McKague, J. M., Millidge, E. G.,



Exterior view of Col. Orville E. McKim's small animal hospital and kennels, Boston Post Road, Port Chester, New York

Mitchell, C. J., Pascoe, P. J., Reid, V. H., Robertson, D. B., Schroder, D. K., and Woolner, R. W.

INFORMATION HAS BEEN OBTAINED ON FOLLOWING MEN

Andries, E. P.	Ingle, R. T.
Armstrong, A. B.	Jones, T. L.
Armstrong, W. J.	Julian, J. F.
Bain, A. F.	Kidd, A.
Ballantyne, J. H.	Kingscote, A. A.
Barnum, D. A.	Leatherdale, J. B.
Beattie, R.	Lingua, P. F.
Behan, J. A. T.	Livermore, R. G. H.
Best, J. P.	Lott, D. G.
Best R. J.	McCabe, F. J.
Bett, A. W.	McDole, D. H.
Bett, T.	McKelvie, D. J.
Boyce, G. H.	McKercher, D. G.
Bone, J. K.	McKinnon, A. J.
Cairns, G.	McLean, J. E.
Cameron, A. E.	McSkerry, B. J.
Campbell, K. C.	MacDonald, G. I.
Campbell, G. A.	MacNabb, A. L.
Campbell, L. A.	Maud, S. H.
Case, L. I.	Mitchell, J. M.
Colgate, R. F.	Morrow, A.
Comfort, C. F.	Mummery, R. L.
Cowan, W. H.	Murray, G. J. B.
Davis, H. J.	Murray, R. B.
Day, J. E.	Mustard, J.
Denny, W. A.	Nelson, F. C.
Devereux, R. J.	Nordland, O. S.
Dolby, W. B.	O'Donoghue, J. G.
Drover, J. E.	Pallister, E. F.
Durant, L.	Palmer, H. E.
Eddy, E. C.	Peer, B. R.
Elgie, S. W.	Reeker, W. H.
Elliott, R. W.	Richardson, J. J.
Etor, F. R.	Robinson, J. E.
Faulkner, D. E.	Robson, G. F.
Fisher, G. C.	Rowe, K. B.
Fitts, R. H.	Rumney, W. J.
Garrick, D.	Schroder, J. D.
Gill, J. M.	Scott, J. H.
Gilman, J. P. W.	Shain, N. J.
Graesser, F. E.	Smiley, R. G.
Hall, A. V.	Smith, D. L. T.
Hall, L. C.	Steep, W. A.
Hamilton, H. H.	Stiles, W. C.
Harlow, M. D.	Talbot, G. P.
Harper, T.	Thompson, R. A.
Hawkins, R. A.	Vandendriesche,
Henderson, J. A.	J. E. A.
Henry, R. H.	Wagner, J. R.
Hill, W. L.	Walker, R. V. L.
Home-Hay, P. E.	Watson, D. D.
Hostrawser, B.	Whiteside, W. H.
Howard, K. A.	Zlotnick, L.

s/A. L. SHEPERD, *Executive Clerk.*

Pennsylvania

Joint Meeting at Clarion.—Dr. John D. McCullough, Clarion, was host at a meeting of three veterinary clubs of western Pennsylvania on May 14, 1946. Dinner at noon was followed by a talk on artificial insemination by Prof. R. H. Olmstead, of the State College, followed by a visit to the bull farm where demonstrations were set up to familiarize the members with all phases of this work.

s/G. B. SCHUEY, *Secretary, Western Pennsylvania Veterinary Association.*

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Keystone Meeting.—Dr. J. F. Shigley, State College, spoke to the members of the Keystone Veterinary Medical Association on April 24, 1946, at the School of Veterinary Medicine, University of Pennsylvania.

s/R. C. SNYDER, *Secretary.*

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Capitol City Association.—Veterinarians in the vicinity of Harrisburg met on May 1, 1946, to reorganize the Capitol City Veterinary Medical Association. Meetings are to be held monthly except during the summer months, the July meeting being a field day demonstration at Hershey.

Officers elected were: Dr. H. W. Herriott, Hershey, *president*; Dr. J. J. Thomas, Lemoyne, *secretary*; and Dr. Paul Landis, Harrisburg, *treasurer.*

s/R, C. SNYDER, *Secretary.*

Philippines

Japanese Deliberate Destruction.—The College of Agriculture, University of the Philippines, at Los Banos, Laguna, site of the veterinary department started by American veterinarians, was systematically destroyed by fire by the retreating Japanese. Collections, laboratory equipment, library, and records were demolished, and purebred animals were annihilated. Dean L. B. Uichanco, who was under sentence of death in 1943, writes that the college must be started anew and that he cheated death twice while the Japanese were committing wholesale massacres of the Filipinos.

Puerto Rico

America's Problem Child.—Britain has its India, Holland its Java, and the United States its Puerto Rico, the most densely populated area on earth. Ever since General Miles invaded that island during the Spanish-American War, in 1898, much has been written about its poverty-stricken population of 2 million, which is packed into a meager 3,400 square miles of tropical territory, mostly of nonresident ownership and management. Although in no respect different from the other Latin-American lands of the same general type, reports of its slums, its crimes, and its political problems have been held out as liabilities without concurrent credits to which its people are entitled. In the secular jargon, little is ever told of its literature on public health and medical science, of its famed School of Tropical Medicine, its comprehensive surveys of sanitation and nutrition, nor of guiding agricultural trends, all of which are being laid down as the fundamentals of a better future. Forty-eight years, or less than two generations, is but a fraction

of the five centuries since the island was taken over by the white man.

Jack Thale *(Miami, Fla., Herald,* Feb. 19, 1946) writes, in a scholarly article, that malnutrition, scientifically determined, is the foremost problem for the politicians to negotiate in behalf of these so-called backward people. Meat and milk in lieu of rice, codfish, and beans, not moral law and regulation, must be the starting point of corrective measures. Puerto Rican science has laid down the basic facts for the political circle to use in the handling of this allegedly unsolvable problem. Admittedly, the task is not easy, but that does not change the principle that hitching the horse before the cart is the best way to start on a journey.

Dr. F. D. Egan, Detroit, Mich., to whom we are indebted for the newspaper clipping, adds, "This is what would happen in the United States with deficient meat and milk supply."

Texas

Junior AVMA.—The student chapter of the AVMA at Texas A. and M. College, at their March meeting, listened to Mr. J. D. Prewit, vice-director of the extension service, who spoke on the relations which should exist between the county agent and the veterinarian.

March 23 was the date on which the annual dance for students and faculty was held.

Prof. I. W. Rupel, head of the Department of Dairy Husbandry, provided the program for the April meeting of the chapter, in the form of an illustrated lecture on artificial insemination which attracted a full house, according to a report in the *Texas Veterinary Bulletin.*

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Houston Association.—The Houston Veterinary Medical Association held its regular monthly meeting on April 4, and elected the following officers: Dr. J. W. Williamson, Houston, *president;* Dr. J. Gilbert Horning, Houston, *vice president;* and Dr. Edward Lepon, Houston, *secretary-treasurer.*

Dr. R. C. Dunn, of College Station, discussed anaplasmosis and piroplasmosis of small and large animals at the meeting on May 2.

At the meeting on June 6, Dr. R. D. Turk, also of College Station, demonstrated field diagnosis of internal parasites and outlined control measures which can be used by veterinarians. s/EDWARD LEPON, *Secretary.*

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New Courses in Agriculture.—Changes in the range of courses to be given at Texas A. & M. College include majors in animal husbandry, dairy production, poultry husbandry, and wildlife management. The trend is toward better technically trained men in modern agriculture.

Washington

State College Receives $20,000 Grant.—Swift & Company, Chicago, have donated a grant of $2,000 to the Department of Animal Husbandry at Washington State College for research on nutrition and breeding of animals. Dr. E. J. Warwick, in charge of breeding investigation, was designated to head the project.

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Great Herd-Bull Prospect.—WHR Royal Duke 18th, recently sold for the record price of $25,000 by the Wyoming Hereford Ranch, Cheyenne, Wyo., to the Aldarra Farms, Issaquah, will be added for two years to the Washington State College herd at Pullman.

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Health of Animal Exhibits at Fur Exposition.—The published report of the Pacific Northwest Fur Exposition and Style Show contains the following significant item:

> Dr. O. J. Hummon, D.V.M., in charge fur animal disease research, Fish and Wildlife Service, rendered a very important service in making health examination of the show animals before entries were accepted.

Going out of mind is the day when animals were agglomerated for exhibition and then permitted to scatter infections to the four winds.

Wisconsin

Officers Elected at Eau Claire.—At a meeting of the Central Wisconsin Veterinary Medical Association on April 10, all officers were reëlected. Dr. John R. Berggren, of Baldwin, is *president;* Dr. R. A. Garman, of Tomah, *vice-president;* and Dr. S. K. Andreassen, Menomonie, *secretary-treasurer.*

In addition to the program published in the April JOURNAL, there was a discussion of the new brucellosis control regulations which was led by Dr. Paul C. Bennett, of Madison; and a film "Skeletal Fixation by the Stader Splint—Fractures of the Tibia."

Dr. M. L. Claflin, of Barron, acted as toastmaster during the banquet which was attended by more than 60 veterinarians and their wives.

s/S. K. ANDREASSEN, *Secretary.*

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North Eastern Association.—Dr. Burch Royer (Ont. '98), Shawano, was the honored guest of the Northeastern Wisconsin Veterinary Medical Association on May 16, 1946, at Oshkosh. Speakers on this program were Dr. J. S. Healy, inspector in charge, BAI; Dr. V. S. Larson, chief, Livestock Sanitation, and Dr. B. A. Beach, University of Wisconsin. Dr. R. C. Klussendorf, of the AVMA, was the speaker at a dinner attended by the members and their wives.

s/WILLIAM MADSON, *Secretary.*

Foreign

Argentina

"Beefy" Holsteins.—After the Argentine imported Holstein-Friesians from Holland years

ago, there was developed a "beefy" type of that breed that now competes sharply with the Shorthorns in that great beef-producing country. Shipments to the packing center at Buenos Aires sell on arrival, while consignments of other breeds may not sell for a week. One estate has 18,000. Mothers nurse their calves during the day until they are 7 to 9 months old and 95 per cent of them are milked but once a day in open sheds, according to S. B. Hall, Oregon breeder, who judged the 1944 National Dairy Show at Buenos Aires. Under this ranch life, trouble has been xperienced in producing purebred bulls. Yet, at the sale following the dairy show, cows averaged $750 a head and 1 brought $6,750. Breeders come to the United States for purebred stock, notwithstanding that the freight is $500 a head. The significance of the trend, according to *Western Dairy Journal*, is that "Argentina is destined to become a real Holstein-Friesian breeding country."

Brazil

Third Brazilian Veterinary Congress.—The program, instructions, and regulation of the *III Congresso Brazileiro de Veterinaria* which was held at Porto Alegre, Rio Grande do Sul, Oct. 1 to 5, 1945, under the presidency of Dr. Heitor Fábregas and the official roster, reflects remarkable developments in the veterinary service complimentary to the Western Hemisphere. The Congress was sponsored by *Sociedade sul Brazileiro de Medicina Veterinaria* in coöperation with state and municipal veterinarians, and related professionals. The fine illustrations of buildings and equipment, depicting the devotion to veterinary medicine in one state alone—Rio Grande do Sul—speak for themselves in amazing fashion. The work of the Congress was divided into eight sections: Scientific Research, Infectious-Contagious Diseases and Livestock Sanitary Police, Parasitisms, Animal Production, Hygiene and Technology of Animal Products, Military Veterinary Medicine, Medicine and Surgery, and Veterinary Education and Professional Interests. Represented were the states of Sao Paulo, Minas Gerais, Paraná, Espirito Santo, Santa Catarina, Pernambuco, Rio de Janeiro, and Bahia.

France

Death of Professor Moussu.—Professor G. Moussu (1864-1945) died Oct. 16, 1945, in retirement at his home in Saint-Laurent-en-Gatine, Department of Indre-et-Loire, the place of his birth. Professor Moussu was famed for his researches and writing on the pathology of farm animals: large and small ruminants, swine, and poultry. His work on the thyroid and parathyroid glands of which he wrote in the nineteenth century places his name among the pioneer endocrinologists. His treatise on diseases of cattle (*Traite des Maladies du Betail*) remained a standard text book in English-speaking countries for many years. He was the W. L. Williams of France. But what is not too generally known was that Moussu was the first to employ the intradermal tuberculin test in cattle. He was a collaborator of Mantoux (1908), of Mantoux test fame, and lived to see his work in that connection established permanently all over the world. Although all of the credit goes to Mantoux, it was in Moussu's clinic at Alfort and with his insistence and coöperation that the merits of the test were proved. For its early adoption as the official test in Missouri, Dr. D. F. Luckey was granted the International Congress Prize of the AVMA in 1944.

• • •

AVMA Summary of Wartime Work.—The long postal "black out" between France and America prevented the circulation of the AVMA monthly *Veterinary Science Newsletter* (in continental France) which was distributed by the

—*Brazilian Dept. of Agriculture.*

Front and rear facades of the hospital and clinic of the School of Agriculture and Veterinary Medicine, University of Porto Algere, State of Rio Grande do Sul, Brazil.

Office of War Information during the period of hostilities, for the declared purpose of keeping involved countries informed on the development of veterinary science.

"It was, therefore, thoughtful of the AVMA," writes a Quebec correspondent, "to summarize the wartime work of North American veterinarians in the *Bulletin de l'Académie Vétérinaire de France* as was done in the January (1946) issue of that periodical." It may be observed that the veterinary service of France, the cradle of modern veterinary medicine, in its effort to make up for the time lost by events of the past five years, is combing the world for links to forge in her broken chain.

[The French veterinary academy, founded in 1844, was established by presidential decree as an "establishment of public utility" in 1878. Among its presiding officers were such figures as Barthelemy (1844), Bouley (1847), Goubaux (1857), Leblanc (U. and C., 1858 and 1878), Railliet (1890), Barrier (1892), Trasbot (1895), Cadiot (1897), Moussu (1901), Deschambre (1913), Petit (1920), Coquot (1922), Drouin (1923), Vallée (1924), Leclainche (1928), Brocq-Rousseu (1933), Bourdelle (1936), Lebouyries (1941), Nieder (1944), Urbain (1945), Bressou (1946), to choose familiar names from the literature. The Academy has a restricted membership composed of titular members, national and foreign associates, and national and foreign correspondents. John R. Mohler, Washington, D. C., retired chief of the U. S. Bureau of Animal Industry, is one of four foreign associates along with Lanfranchi (Italy), Marek, (Hungary), and Nowak (Poland). Hilton (Canada). C. W. Stiles, Smithsonian Institute, Washington, D. C., and Merillat (Chicago) are foreign correspondents for North America. W. L. Williams (New York), deceased, was one of the correspondents.—Editors.]

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Wartime Medical Research.*—During German occupation, medical research was restricted on account of lack of personnel, equipment, material, and laboratory animals and, besides, French physicians paid heavy tribute to the Nazis; some committed suicide like the great brain surgeon Thierry de Martel the day the Germans entered Paris and Jacque Charles Bloch when the Gestapo came to arrest him. Surgeon Desplat was arrested and many were deported, including Ricket, Desoile, and Weis. Many physicians either died in Germany or a few days after their return. Vallery-Radot, Debre, Etienne Bernard, and Haguemau escaped arrest but had to stay in hiding. Worry over deported relatives and friends, anxiety for one's family, and constant fear of reprisal shootings, not to mention heartaches over the country's fate, gravely affected serious thinking and work. The cutting off of gas and electricity at irregular hours made bacteriologic and pathologic investigations impossible. But, scientific studies cannot be smothered. French physicians did important work on haptoglobin—the enzyme power of hemoglobin—which is useful in many pathologic conditions, namely, observation on the antithyroid action of aminothiazole, isolation of epicatechol whose action diminishes capillary fragility and is similar to vitamin P; in Halpern's studies of antihistamine compounds, in Reilly's researches on the sympathetic system, and in Brumpt's rapid agglutination test for typhoid and typhus. Unfortunately, French physicians were afforded the opportunity to study many deficiency diseases as a result of the malnutrition of the French people. An unusual observation was a gain in weight of 10 to 15 kg. among 300 young women and girls through exaggerated deposits of flesh on the legs, abdomen, breasts, and hips with hard, cellular, noninflammatory infiltration of the skin, vasomotor troubles of the extremities, loss of hair, and fragile nails, all of which was found to be caused by an abnormal endocrine state.

*Condensed from J.A.M.A., *131*, (May 4, 1946): 57-58.

Iran

Sheep Population.—Iran (Persia), home of the first shepherds of sacred and secular history, which once had a sheep population of 40 million head, has suffered a decline in its flocks to 7 or 8 million head, during a period corresponding to its ascendancy in oil wells. The decline is reflected in the increase in the price of mutton—from 5 cents per kilogram fifteen years ago to $2.00 per kilogram in 1945. The figures (from *California Wool Grower*, Nov. 15-16, 1945) are useful in pointing out the effect of diminishing returns from livestock in terms of economic stability and food supply.

The cause of the decline is attributed to governmental measures affecting the lives of the sheep growers, obviously, neglecting sheep and trusting to oil. The case of the Iran sheep is an example of the old, old story of human diffidence (or should one say stupidity) that is as difficult to explain as its known effects are alarming.

COMING MEETINGS

Sociedad Insular de Médicos Veterinarios. Hato Rey, Puerto Rico, June 1-2, 1946, O. A. López-Pacheco, P. O. Box 155, Hato Rey, P. R., secretary.

Texas Veterinary Medical Association. Texas A. & M. College, College Station, June 4-5, 1946. E. A. Grist, Box 951, College Station, Texas, corresponding secretary.

Missouri Veterinary Medical Association. Colonial Hotel, Springfield, Mo., June 10-11, 1946. J. L. Wells, Box 676, Kansas City 10, Mo., secretary-treasurer.

Oklahoma Veterinary Medical Association. Tulsa Hotel, Tulsa, Okla., June 10-11, 1946. C. H. Fauks, 507 Cotton Exchange Bldg., Oklahoma City, Okla., secretary-treasurer.

Ohio State University, Annual Veterinary Conference. College of Veterinary Medicine, Ohio State University, Columbus, June 12-14, 1946. Walter R. Krill, College of Veterinary Medicine, dean.

Maryland State Veterinary Medical Association. Hotel George Washington, Ocean City, Md., June 20-21, 1946. J. W. Hastings, Box 252, Cambridge, Md., secretary-treasurer.

Michigan State Veterinary Medical Association. Pantlind Hotel, Grand Rapids, Mich., June 25-26, 1946, B. J. Killham, Michigan State College, East Lansing, Mich., secretary.

North Carolina State Veterinary Medical Association. George Vanderbilt Hotel, Asheville, N. Car., June 27-29, 1946. B. H. Staton, Box 453, Rocky Mountain, N. Car.

Utah Veterinary Medical Association. Veterinary Bldg., Utah State Agricultural College, Logan, Utah, June 28-29, 1946. O. G. Larsen, 641 E. 7th St., North Logan, Utah, secretary.

Idaho Veterinary Medical Association. Boise, Idaho, July 1-2, 1946. Phil H. Graves, Box 186, Idaho Falls, Idaho, secretary.

Montana Veterinary Medical Association, Helena, Mont., July 8-9, 1946. E. A. Tunnicliff, Montana Agricultural Experiment Station, Bozeman, Mont., secretary.

New York State Veterinary Medical Association. Syracuse, N. Y., July 9-11, 1946. J. J. Regan, 1231 Gray Ave., Utica, N. Y., secretary.

North Dakota Veterinary Medical Association. Fargo, N. Dak., July 15-16, 1946. F. M. Bolin, 1503 S. 6th St., Fargo, N. Dak., secretary-treasurer.

Northwest Veterinary Medical Association. New Washington Hotel, Seattle, Wash., July 16-18, 1946. M. O. Barnes, P. O. Box 1163, Olympia, Wash., secretary-treasurer.

American Veterinary Medical Association. Eighty-third Annual Meeting. Hotel Statler, Boston, Mass., Aug. 19-22, 1946. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Southern Veterinary Medical Association and Kentucky Veterinary Medical Association. Brown Hotel, Louisville, Ky., Sept. 30, and Oct. 1-2, 1946. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary-treasurer.

Purdue University. Short Course for Veterinarians. Purdue University, Lafayette, Ind., Oct. 2-4, 1946, C. R. Donham, Dept. of Veterinary Science, Purdue University, head.

Pennsylvania State Veterinary Medical Association. Penn Harris Hotel, Harrisburg, Pa., Oct. 9-11, 946. R. C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association, Inc. Hotel Montrose, Cedar Rapids, Iowa, Oct. 15-16, 1946. C. C. Graham, Wellsburg, Iowa, secretary.

University of Missouri. Short Course for Veterinarians. University of Missouri, Columbia, Nov. 4-6, 1946. A. J. Durant, Dept. of Veterinary Science, University of Missouri, chairman.

American Public Health Association. Cleveland, Ohio, the week of November 11, 1946.

United States Livestock Sanitary Association. Hotel La Salle, Chicago, Ill., Dec. 4-6, 1946. R. A. Hendershott, 33 Oak Lane Ave., Trenton 8, N. J., secretary-treasurer.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Massachusetts Veterinary Association. Hotel Vendome, Boston, Mass., the fourth Wednesday of each month. H. W. Jakeman, 176 Federal St., Boston 10, Mass., secretary-treasurer.

New York City Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Saint Louis District Meetings. Roosevelt Hotel, St. Louis, Mo., the first Friday of each month. C. W. Darby, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

STATE BOARD EXAMINATIONS

Florida—The Florida Board of Veterinary Examiners will hold its next examination June 17-19, 1946, at the George Washington Hotel, Jacksonville, Fla. Address inquiries to H. C. Nichols, secretary-treasurer, Box 405, Ocala, Fla.

Illinois—The Veterinary Examining Committee of the Illinois Department of Registration and Education will hold its examination July 29-30, 1946, at 106 N. La Salle St., Chicago. Applications should be filed with Supt. Phillip M. Harman, Department of Registration and Education, Springfield, Ill. For other information also address Supt. Harman.

Iowa—The Iowa Veterinary Medical Examining Board will hold its next examination June

17-18, 1946, 8:00 a.m., at the office of the Division of Animal Industry, State House, Des Moines, Iowa. Address inquiries to C. C. Franks, chief, Division of Animal Industry, State House, Des Moines 19, Iowa.

Louisiana—The Louisiana State Board of Veterinary Medical Examiners will hold its next examination Aug. 14, 1946, at the State Capitol, Baton Rouge, La. Only applicants from accredited colleges are eligible. Address inquiries to J. Arthur Goodwin, secretary, New Iberia, La.

Nebraska—The Nebraska Bureau of Examining Boards will hold its next veterinary examination June 20-21, 1946, 8:30 a.m., at the State Capitol Bldg., Lincoln, Neb. Applications must be filed with the Bureau at least 15 days prior to the first day of the examination. Address inquiries to Oscar F. Humble, director, Bureau of Examining Boards, Dept. of Health, Room 1009, State Capitol Bldg., Lincoln 9, Neb.

North Carolina—The North Carolina Veterinary Medical Examining Board will hold its next examination June 27, 1946, at the George Vanderbilt Hotel, Asheville, N. Car. Address inquiries to P. C. McLain, secretary-treasurer, Route 1, High Point, N. Car.

Utah—The Utah Veterinary Examining Board will hold its next examination June 10-11, 1946, Room 326, Capitol Bldg., Salt Lake City, Utah. Address inquiries to W. H. Hendricks, chairman of board, Room 326, Capitol Bldg., Salt Lake City, Utah.

Virginia—The Virginia State Board of Veterinary Examiners will hold its next examination July 1-2, 1946, at the John Marshall Hotel, Richmond, Va. All applications must be filed with the secretary ten days prior to examination. Address inquiries to H. T. Farmer, secretary-treasurer, Box 436, Richmond 3, Va.

West Virginia—The West Virginia Veterinary Board will hold its next examination Aug. 5, 1946, 9:00 a.m., at the Hotel Gore, Clarksburg, W. Va. Applications must be filed with the secretary at least ten days before date of examination. Applications accepted from graduates of recognized and approved schools only. Address inquiries to W. E. Trussell, secretary, Charles Town, Jefferson County, W. Va.

BIRTHS

To Dr. (Wash., '44) and Mrs. W. J. Krebs, Box 671, Grants Pass, Ore., a daughter, Karen Mary, Dec. 12, 1945.

To Dr. (O.S.U., '44) and Mrs. Howard S. Smith, 620 Phillips St., Yellow Springs, Ohio, a son, Michael Adrian, Feb. 24, 1946.

To Dr. (Colo., '44) and Mrs. Benjamin W. Kettle, Westcliffe, Colo., a son, April 11, 1946.

To Dr. (M.S.C., '38) and Mrs. A. C. Nagle, 116 Dickson St., San Antonio 4, Texas, a son, Edward Francis, April 21, 1946.

MARRIAGES

Dr. R. H. Strous (I.N.D., '21), Wolcott, Ind., to Miss Ynez B. Shorpe, March 31, 1946.

DEATHS

LeRoy C. Ball (McK. '15), 65, Titonka, Iowa, died March 21, 1946. Dr. Ball was born in Monroe, Wis., but had lived and practiced in Titonka after his graduation as a veterinarian. For the past two years, he had suffered from heart trouble. Dr. Ball was admitted to the AVMA in 1928.

H. C. Balzer (U.P. '88), 81, Meriden, Conn., died April 20, 1946, of a heart attack. The oldest veterinarian in the state of Connecticut, he had served for ten years as meat and milk inspector. Dr. Balzer was one of the pioneers in the state in tuberculin testing of cattle.

G. W. Bowker (K.C.V.C. '09), 64, Rolla, Mo., died March 29, 1946, of a coronary attack, at De Paul Hospital, St. Louis. He was born July 1, 1881, in Odebolt, Iowa. Dr. Bowker was admitted to the AVMA in 1916.

C. S. Evans (C.V.C. '03), Appleton, N. Y., died March 4, 1946.

W. J. Fretz (Amer. '99), 68, St. Paul, Minn., died in September, 1945. He was born at Hamlin, Kan., on Oct. 15, 1877. At the time of his death, he was with the BAI in St. Paul. Dr. Fretz was admitted to the AVMA in 1927.

A. G. Hill (Harv. '88), Somerville, Mass., died Jan. 21, 1946. Dr. Hill had practiced in and around Boston until he became ill two years ago.

M. D. Hollis, Armada, Mich., died Jan. 10, 1946.

L. F. Miller (C.V.C.), 71, Morristown, S. D., died recently in Aberdeen after a brief illness. Dr. Miller had practiced at LaSalle, Ill., for eleven years before he came to South Dakota in 1910. He farmed in Morristown in addition to carrying on a regular veterinary practice.

D. M. Robertson (Ont. '12), 55, Brockville, Ont., died May 12, 1945. Dr. Robertson was born Nov. 21, 1889, at Victoria, B. C. He was admitted to the AVMA in 1926.

J. R. Willard (Ind. '14), Fairland, Ind., died Jan. 4, 1946.

THE VETERINARY PROFESSION AND THE WAR

Awards and Citations

"For exceptionally meritorious conduct in the performance of outstanding services," the Legion of Merit has been awarded to each of the following officers in the Veterinary Corps:

Col. Seth C. Dildine
Col. Burton A. Seeley
Col. Raymond Randall
Major Don L. Mace
Col. John L. Owens
Col. Harold E. Egan
Col. Christian W. Greenlee

Veterinary Officers Separated from Military Service

Alabama
Davidson, Wm. Max
Dobbs, William R.

California
Clark, David S.
Cope, Russell P.
Dalziel, George T.
Jurden, Richard H.
Lee, Philip A.
McFarland, Ray W.
Ogburn, Leonard L.
Ommert, Willard D.
Parrell, Hyman H.
Smith, Sydney M.
Steinmetz, Wm. E.
Vierheller, Ralph C.
Vietti, John D.
Weston, Ralph S.
Wixom, Herald G.

Colorado
Barrows, Ernest D.
Gorman, Harry A.
Meyer, Joshua F.
Ramsey, Donald D.
Tornow, Winston H.
Yount, Virgil A.

Connecticut
McDonald, A. R.
Stern, Douglas N.
Winn, John D.

Florida
Ausherman, R. J.
Foote, Lon E.
Knowles, Jack O.

Georgia
DeMilly, J. W. Jr.
Hinson, Conrad R.
Wise, Thomas M.

Illinois
Brown, James R.
Hampton, G. G. Jr.
McCannon, Willis B.
Meyer, Frank L.
Peters, Max R.
Raudabaugh, W. G.
Rodabaugh, D. E.

Indiana
Spieth, Emmett W.

Iowa
Bartley, Frank E.
Burnham, Claire H.
Flickinger, C. R.
Gathmann, A. C.
Greenfield, Alex.
Grell, Hans
Hanna, H. E. Jr.
Jacobs, Robert C.
Koll, Carl H.
Marriott, John K.
Monlux, Andrew W.
Schmidt, Martin G.
Tucker, Carl C.

Kansas
Beard, Theodore M.
Clark, Forrest W.
Coates, A. S., Jr.
Curry, Philip H.
Eskeldson, James A.
Eyestone, W. H.
Fieser, John E.
Havlik, Albert L.
Johnson, W. P.
Parsons, Elton V.
Rush, Loyal L.
Shea, Richard A.
Thomas, Roy C.
Thompson, C. H. Jr.
Whitney, Don O.
Zinn, Glenn A.

Louisiana
Lank, Robert B.

Maine
Scamman, L. H.

Massachusetts
Fanning, James J.

Michigan
Caswell, Don L.
Davidson, Laurie R.
Henshaw, Russell J.
Houghton, H. R.
Israel, Irving
Reichert, Paul F.
Sutton, Karl L.
Winter, Alan W.

Minnesota
Leonard, Harry A.
Schwartz, A. V. Jr.,

Mississippi
Chadwick, Chas. W.
Lindley, W. H.-C.

Missouri
Cassias, Charles S.
Dodd, Daniel P.
Hamilton, Clare C.
Hartzell, H. P.
Patton, Glen Frank
Valentine, H. D.

Montana
Gould, Clinton L.

Nebraska
Hargreaves, R. E.
Leonard, George A.

New Hampshire
MacKenzie, E. R.

New Jersey
Ruck, Richard A.
Silverstein, E.
Urban, William D.

New York
Boldt, Vincent Leo
Favata, Anthony F.
Hirschey, W. C.
Johnson, Norman H.
McCarthy, J. J. Jr.
Merenda, Joseph J.
Morris, Robert B.
Schiller, Harry
Thiele, Arthur R.
White, Howard S.

North Carolina
Allen, Jap C.
Cornwell, James I.
Nitka, Anthony A.

North Dakota
Bjornson, Sidney S.

Ohio
Apple, Henry J.
Barber, Russell A.
Batchelder, Ray M.
Elliott, Berton J.
Ferguson, Lloyd C.
Finney, E. M.
Gluhm, Frank N.
Holmes, John M.
Johnson, Earl F.
Linzinmeir, Chas. B.
McMahan, R. L.
Nagle, Albert C.

Oklahoma
Molt, Fred Lester

Oregon
Blake, Gordon W.
Carter, L. B.
Hostetler, Roy I.

Kraft, James C.
Morehouse, E. W.
Oliver, Victor T.

Pennsylvania

Burstein, Harold
Davies, Frank J.
Hummer, Robt. Leo
Walbert, B. L. Jr.

South Carolina

Wiser, Keith Bud

South Dakota

Aldrich, Percy M.
VanMeveren, A. F.

Tennessee

McKinney, E. B. Jr.

Texas

Coburn, Geo. C.
Einhorn, Ralph W.
Horn, Wiley H.
Leathers, Robt. B.
Schwarzenbach, H. F.
Shull, Hubert T.
Yarbrough, Paul R.

Vermont

Denton, Jack I.

Virginia

Koudelka, T. P.
Witter, Willis F.

Utah

Haynie, Fred B.
Henkel, Ernest L.

Washington

Christofferson, F. F.
Clarke, Don W.
Clinton, Robert L.
Graff, Virgil E.
House, Donald D.
Ledgerwood, M. L.
Saunders, C. M.
Smith, Edward B.
Ward, Willard D.
Wittrock, Jack E.

Wisconsin

Eastwold, John D.
McDermid, Arlye M.
Nebb, Samuel S.

Wyoming

Madsen, Peter E.

Address Unknown

Martin, Ellis J.
Nolan, Timothy F.
Richards, J. P. Jr.

Bunker Hill Monument in Charlestown, Mass., commemorates the battle of Bunker Hill fought on June 17, 1775.

Where History Closed an Argument

At a private dinner conversation the other day with prominent breeders of livestock who are well-known at every national show and state fair in the country, and who are men amazingly familiar with the disease problems of their undertaking (brucellosis, tuberculosis, mastitis, hog-cholera *et al.*), there was an under-current of criticism about the shortage of veterinarians who concern themselves over the more disturbing problems confronting the higher levels of animal production. Investment capital in thousands goes into hiding and hundreds of breeders quit cold when, for one example cited, abortion storms overtake even the most competent breeders of purebred cattle. Breeders devoted to the all-important program of breed improvement, not as a hobby as might be supposed but as a business man's test of animal breeding as an economic project, abandon their luxurious installations when, despite preventive management, disease comes along and upsets all mathematical calculations, one of these outstanding figures of the livestock world declared in substance.

Another major complaint registered concerned the inconsistencies in our sanitary laws regulating, if not stopping, the movement of livestock from one state to another. The contradictions of some of these laws was politely denounced as confusing to stockmen, whereupon the veterinarian of the group reminded these captains of industry and gentlemen farmers that "this country was 103 years old before a single penny of tax money was spent to control livestock diseases and 144 years old before the states actually took over the responsibility. You gentlemen who call your representatives and senators, state governors, and tycoons of agriculture by their first names oughtn't to have let that happen, and just what are you doing to set things right, now? Veterinary science is, and always was, thirty years ahead of the livestockman's will to use it."

"Jim, who do you think will win the big race tomorrow?" The conversation was channeled in another direction.

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Pyrone Powder is supplied in handy 4-ounce, sifter-top, tear-label cans for dispensing and in economical 1-pound sifter-top cans for livestock and kennel use.

For Fox Ranches

Jen-Sal supplies Pyrone Powder—5% DDT with Pyrethrin, for foxes and minks on special order. Write our Kansas City office for quotations.

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